PREMIUM LINE

MADI / AES Technology . Made by RME

What is MADI?

MADI - **M**ultichannel **A**udio **D**igital **I**nterface - is the Pro Audio Industry standard for multichannel audio. MADI is the perfect solution for the transmission of multiple digital audio channels, avoiding the technical problems of the standard multicore cables: too short, aging, high weight, stray pick-up, cable loss, cumbersome handling.

On the contrary MADI: All signals within one optical or coaxial cable. Only two MADI cables will interface a full 64-channel application, a stage, a theatre, or a conference hall.

MADI users can benefit from cost savings and lower maintenance on the overall installation. MADI solutions combine the same basic functionality with improved flexibility over a much smaller cable as a conventional multi-core snake.

MADI is ***the*** solution for the special pro audio requirements.

A thin cable transmits up to **64** audio channels - lossless - over distances of up to 2000 meters!

Example . Digital Multicore

HDSPe MADI

128-Channel PCI Express Card with optical and coaxial MADI I/O

optical cables

2 x 64 channels . up to 2000 m

ADI-6432

64-Channel bidirectional AES/EBU frontend

MADI today. The MADI standard was defined by the AES (Audio Engineering Society). Many factors have influenced the increasing importance of MADI in professional audio production systems. These include an overall growth in the use of digital audio equipment, and the ever increasing demand for greater numbers of audio channels in large productions. Modern surround sound production has also raised the requirements of multi-channel applications. Today MADI is an attractive and convenient interface technology, as it provides the *simplest* method of transmitting audio channels sample-accurate over long distances. The balance between operating distances, installation costs and overall maintenance is exemplary.

Theory. Technically, MADI keeps AES/EBU 24-bit signals in serial. Time Division Multiplexing is used to fit all audio channels into a single cable. MADI is unidirectional, providing a 'point-to-point' interface between a source and a destination. The MADI format is capable of transmitting up to 64 audio channels at standard sample rates of 44.1 or 48 kHz on a standard 75 Ohms coaxial cable or an optical fibre cable. MADI can also be used to transmit high sample rate audio signals. The 64-channel mode allows for a maximum sample rate of 48 kHz, corresponding to 32/16 channels at 96 kHz/192 kHz.

RME Micstasy . High-End Mic/Line Preamp and AD converter with MADI I/O

One cable for all channels. MADI provides a convenient method of transmitting multiple audio channels more efficiently. MADI signals can be transmitted by two cable types:

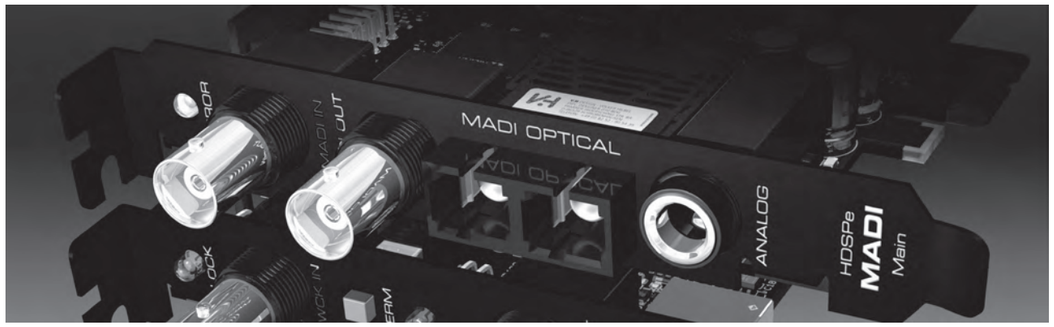
- Coaxial, max. 100 m (75 Ohms, BNC)
- Optical fibre glass, max. 2000 m (62.5/125 µ, standard network technology)

Traditional multi-pair snakes for different applications in live, studio and installation have been an audio-standard for years and still are. The more channels are needed the more a snake becomes invaluable. The use of a snake, especially in mobile applications or on the road, does not become more reliable as the time goes by. It will get hoisted, coiled and often stomped on by the crowd. Under stress conditions there often might not be any time to analyze a fault and fix it. In most cases a faulty snake becomes obsolete and has to be replaced completely. Even if money does not matter – problems occurring on a 64-channel snake can hardly be controlled.

Practice. Integrating MADI solutions into an audio network not only increases more than just reliability. The setup and cabling is simple, too. Routings are remote controllable without any physical switching or swapping of connections. Patchbays become more and more obsolete in the overall system. Especially when dealing with different acts, performances or shows, MADI simplifies and speeds up any configuration changes. MADI saves time and therefore costs.

In modern production systems - from manageable home studio setups to complex concert hall installations - MADI is used as the multi-channel link between mixing consoles, DAWs, multi-track recorders and other digital outboard gear in large scale digital audio routing systems, or to transmit digitised microphone and line signals from a stage box to a theatre or studio mixing console.

The MADI standard is supported by many pro audio manufacturers: Euphonix, Merging, Lawo, YAMAHA, Stagetec, Studer, DiGiCo/Soundtracs, Fairlight, GENEX, Innovason, Otari, Publison, Soundscape, Jünger, Sony, Cadac, Axon, AMS/Neve and others.



RME has developed innovative technologies to make MADI products even more useful and attractive. RME brought the MADI technology to perfection and made it affordable as well.

The RME product range includes converters and preamps for analog, the common digital formats AES/EBU and ADAT, a MADI router, a MADI Bridge and PCI (Express) solutions for Windows and Mac computers. The traditional MADI standard was usefully enhanced by RME with the included MIDI and RS232 transmission. A special redundance mode (Safe Input Mode) guarantees a secure operation.

The RME MADI Premium Line products and the ADI series front-end devices combine different audio standards such as AES/EBU, ADAT and TDIF into one MADI audio system. Any MADI installation will remain an open system, easily expandable, using RME devices or products from any other major pro audio brand. Please study our examples for simple and complex MADI application setups on the last pages of this brochure.

The cost-effective solution: A flexible analog multichannel connection includes different components: Multicore cable - circuit connectors - breakout box - stagebox - signal splitter. Such a system is usually very expensive. A RME MADI system for 64 audio channels in a simple setup includes two 19" devices (e.g. ADI-648) and a fibre glass connection cable - not more. The cost for such a MADI system includes extensive audio signal processing options, like routing, splitting, merging, plus MIDI in MADI, remote control of all devices and redundancy.

Integrating RME MADI solutions into an audio network not only increases reliability. The setup and cabling is simplified too.

MADI . Made by RME saves time and therefore saves costs. In older buildings, expanding existing cable networks (for more or bigger multi-snakes) can be a major cost factor, or even physically impossible. The low maintenance associated with a MADI installation, compared to analog solutions, saves money and increases reliability.

RME MADI products provide optical and coaxial MADI connectors. The coaxial cable allows for transmission distances of up to 100 meters. The MADI fibre cable connection even allows for transmission distances of up to 2000 meters. The cables used are standard in high-speed computer network technology. There are many applications where long distance audio transmission is required: multi-room production facilities, outside broadcast venues, live venues etc. The optical interface is much more interesting due to its complete galvanic separation. 'MADI optical': The cables have an internal fibre of only 50 or 62.5 µm diameter and a coating of 125 µm. The plugs used are an industry standard, called SC. The cables are available as a duplex variant (2 cables being glued together) or as a simplex variant (1 cable).

The transmission uses the multi-mode technique, which supports cable lengths of up to almost 2000 meters. Due to the wave-length of the light being used (1300 nm), the optical signal is invisible to the human eye. Road-proven MADI-optical cables with cable drums are also available. Ask your Premium Line Dealer for the special AudioAG/ALVA-Cableware program.

MADI Cable Drum by ALVA
100/150/300 m professional 4-fibre SC to SC optical multicore for MADI - on stage, broadcast and TV.

RME MADI Technologies

MIDI & RS232 integration in MADI networks. RME MADI products not only transmit 64 audio channels with a single line, but also MIDI signals (exception: MADI Bridge and MADI Converter). Be it remote control or sequencer applications, MIDI data entering at the physical MIDI input is carried along with the MADI data packages.

At the other end of the MADI line, the data can be collected at the MIDI output for another RME MADI device. Technically, every single MADI channel includes several additional bits, containing various information (Channel Status). RME ensures full audio data compatibility by utilizing the so often unused User Bit within the MADI stream to transmit the MIDI data. The same way serial data is carried along with the MADI data packages. Serial data transmission is supported by ADI-642, ADI-6432 and DMC-842.

Remote Controlling via MIDI. All RME MADI devices can be remote controlled via MIDI, using their own well documented protocol. All units can be programmed with their own ID, providing a separated remote control of multiple devices via a single MIDI channel. Via MIDI the complete device status is read and set.

The HDSP TotalMix™ software for the HDSP/HDSPe cards includes complete MIDI remote control by standard MIDI commands and the widely-usded Mackie Protocol. More information is published in the product manuals.

Remote Control Software. RME provides a free Windows and Mac softare to control all 19" MADI devices. **MIDI Remote** can use any existing MIDI port within the system to perform remote control and status requests of all devices. The software provides both a front-panel like operation and an extended Matrix display. Most appealing is the combination with a HDSP MADI card, offering a direct control of RME Premium Line devices via MADI. The remote control software then uses a virtual MIDI port of the card that directly sends and receives MIDI data via MADI. Furthermore, the protocol is open and fully documented, to allow for custom remote control software projects and applications.

Redundancy. RME MADI devices have the SM-I (Safe Mode-Input) feature to switch automatically between the optical and coaxial port if one of the cables or connections are disconnected by mistake, or are even corrupted.

Worldwide Use. RME Premium Line uses internal switching power supplies. This technology offers several advantages over standard linear regulated power supplies, like worlwide operation with any voltage between 100 and 240 Volts, 50 or 60 Hz. Additionally it is short-circuit-proof, has an integrated line filter, is fully regulated against voltage fluctuations, and suppresses mains interference. The high efficiency factor keeps the units cool. RME's high frequency design eliminates mechanical hum and induced ground loops.

The final of the Soccer Champions' League in May 2007 between Liverpool and Milan at the former Olympic stadium in Athens was broadcast to an estimated 1.2 billion viewers worldwide. A RME full duplex MADI configuration interconnected four broadcast points within the stadium, covering a total distance of about 400 meters with optical MADI cables!
The project was a collaboration of the music services company "Logothetis Music" (also RME's exclusive dealer for Greece) and "Astarti TV Productions" on behalf of NOS (Netherlands Broadcasting Corporation).The sound quality outcome was very pleasing for both collaborators and the ease of setting up as well as the reliability of the system justified RME products and the Logothetis Music crew for their choice. Let's note, though, that the company is already using a fully digitized MADI-DAW system for live and recording applications with great success.

M-32 AD M-16 AD

32/16-Channel 192 kHz Analog to MADI/ADAT converter

Connectivity

M-32 AD: 32 x Analog In (balanced TRS and 25-pin D-sub, up to +24 dBu)

M-16 AD: 16 x Analog In (balanced TRS and 25-pin D-sub, up to +24 dBu)

1 x MADI I/O (optical and coaxial) 32 ch. @ 96 kHz, 16 ch. @ 192 kHz

4 x ADAT Out (TOSLINK) 16 ch. @ 96 kHz (S/MUX), 8 ch. @ 192 kHz (S/MUX4)

1 x ADAT In (for Sync only)

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

The M-series is an unsurpassed flexible basis for the realization of multichannel setups. Combinations of the M-16 AD and M-32 AD converters allow setups with 16, 32, 48, or 64 channels, according to your individual application or budget. Up to four M-16 AD and up to two M-32 AD can be connected in series via MADI, sending up to 64 channels over a single MADI line to the digital receiver. The unit's unique set of features includes analog limiters, three hardware reference levels up to +24 dBu, MADI and ADAT I/O up to 192 kHz, 6.3 mm TRS and D-sub inputs, remote control via MIDI, and operation across a wide range of mains voltages, all packed into a 2U enclosure.

Reference Converter. The M-32 AD offers an outstanding AD conversion to MADI and ADAT formats. Balanced analog inputs based on RME's reference design from the ADI-8 QS guarantee excellent S/N and THD specs across a wide analog level range. Using up-to-date converter technology, the device not only works up to 192 kHz, but also reaches a real-world signal-to-noise ratio of 116 dBA – on all channels.

Limiter. An extraordinary limiter, conceived and optimised for professional studio, stage, and broadcast applications, offers essential operational safety with its capability to limit an input's overload of up to 17 dB without audible distortion (max. input level + 30 dBu).

Technologies. SteadyClock™ guarantees perfect sound quality through efficient jitter suppression, making the device completely independent from the quality of external clock signals. Intelligent Clock Control not only displays every clock status by means of flashing LEDs, but will also retain the last valid input sample rate in case of failure of the external source. Other renowned RME technologies like SyncCheck allow quick detection of clock problems. All settings are retained when the unit is powered off. M-32 AD and M-16 AD have optical and coaxial MADI inputs. In case of failure of an input signal, the source is switched immediately, if a valid signal is present on the other input.

Remote Control. All M-series converters are fully remote controllable and configurable via MIDI. Each unit's complete status can be monitored, including all the front panel's displays. Individual IDs can be set for each unit, allowing separate controllability of several units with a single MIDI channel. Control software for Mac and PC is supplied and allows easy remote control, also with MIDI transfer via MADI (MIDI Extender).

ADAT. The M-32 AD's four ADAT outputs provide simple connectivity with other studio equipment. A combination with RME's HDSPe RayDAT makes a perfect partnership, allowing the transfer of 32 channels into a Mac or PC with regular optical Toslink cables at an unbeatable price.

Stacking. The MADI input serves as optional external clock source, but also as MADI passthrough input. Since the M-32 AD uses only 32* channnels of the MADI signal, unused channels of the input signal are fed through to the output. This way, the signals of two or more units can be combined into one MADI stream of 64 channels, with every unit adding its channels to the input signal, resulting in one line at the output of the second unit.

Delay Compensation. Serial connection of devices via MADI will cause a delay of 3 samples from MADI input to output, thus the MADI signals of preceding converters will arrive delayed at the input of the last unit in the chain. The M-series includes an internal auto correction, which ensures sample-synchronous data at the last unit's output.

Features

- 32-channel* AD converter, fully symmetrical design, 116 dBA
- 19" enclosure with only 2 units height
- Analog limiter can be activated
- 32* LED level meters with 5 LEDs each
- 32* LEDs to display the Limiter state per channel
- SteadyClock™ - prestine sound quality independently from the quality of the external clock signal
- SyncCheck® - unique technology to check clock synchronization
- All settings are stored permanently
- Fully remote controllable

* M-16 AD: 16 channels

The M-16 AD is fully identical to the M-32 AD, with these exceptions:

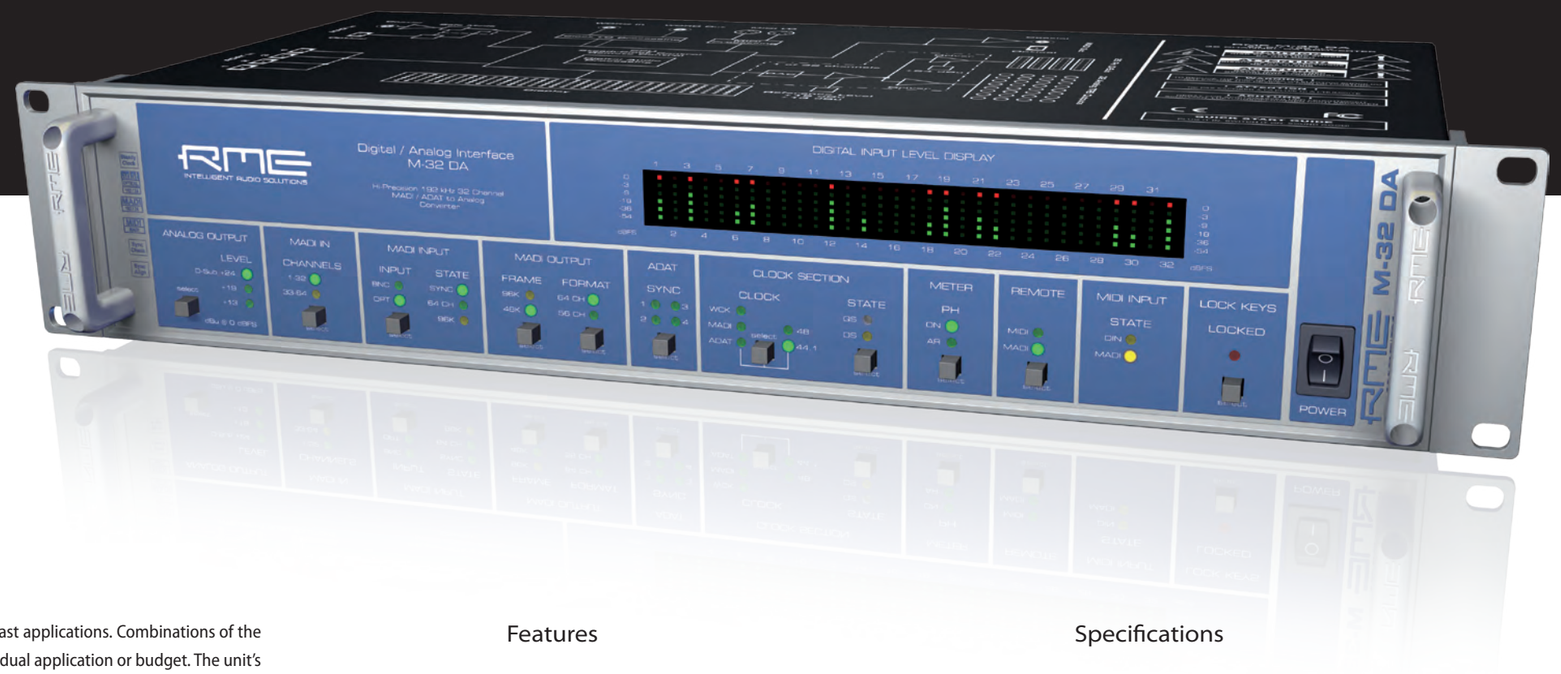
- only one 16-channel AD board fitted
- no fan
- lower power consumption, 40 Watts

Specifications

- Input AD: 1/4"TRS jack and 25 pin D-sub, servo balanced, completely symmetrical audio path
- Dynamic Range AD: 113 dB RMS unweighted, 116 dBA
- THD AD: < -110 dB (< 0.00032 %)
- THD+N AD: < -104 dB (< 0.00063 %)
- Frequency response AD, -0.1 dB: 10 Hz - 23.2 kHz (sf 48 kHz)
- Frequency response AD, -0.5 dB: < 5 Hz - 45 kHz (sf 96 kHz)
- Frequency response AD, -1 dB: < 5 Hz - 80 kHz (sf 192 kHz)
- Input level for 0 dBFS: +24 dBu, +19 dBu, +13 dBu
- Sample rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (Sync/WC)
  Jitter: Typical < 1 ns for internal, Word Clock, ADAT and MADI input
- Jitter sensitivity: all PLLs operate error-free even at 100 ns
- Power supply: Internal switching mode PS, 100V - 240V AC, 60 Watt
- Dimensions: (WxHxD) 483 x 88 x 200 mm

M-32 DA M-16 DA

32/16-Channel 192 kHz MADI/ADAT to Analog converter



Connectivity

M-32 DA: 32 x Analog Out (balanced TRS and 25-pin D-sub, up to +24 dBu)

M-16 DA: 16 x Analog Out (balanced TRS and 25-pin D-sub, up to +24 dBu)

1 x MADI I/O (optical and coaxial) 32 ch. @ 96 kHz, 16 ch. @ 192 kHz

4 x ADAT In (TOSLINK) 16 ch. @ 96 kHz (S/MUX), 8 ch. @ 192 kHz (S/MUX4)

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

The M-series converters have been conceived and optimised for professional studio, stage, and broadcast applications. Combinations of the M-16 DA and M-32 DA converters allow setups with 16, 32, 48, or 64 channels, according to your individual application or budget. The unit's unique set of features includes three hardware reference levels up to +24 dBu, MADI I/O and ADAT input up to 192 kHz, 6.3mm TRS and D-sub outputs, remote control via MIDI, and operation across a wide range of mains voltages, all packed into a 2U enclosure.

Reference Converter. RME's M-32 DA is a 32-channel high-end DA converter, easy to operate yet having a comprehensive feature set. The unit combines excellent analog circuit design from the ADI-8 QS and DMC-842 with the latest converter chips and RME's superior SteadyClock, resulting in a state-of-the-art DA conversion, with outstanding S/N and THD specs.

Analog Outputs. The units have separated driver stages for the TRS and D-sub outputs. The servo-balanced TRS jacks will work up to +21 dBu. When selecting +24 dBu the balanced D-sub connector outputs will provide the higher output level while TRS stays at the +19 dBu setting.

Technologies. SteadyClock™ guarantees perfect sound quality through efficient jitter suppression, making the device completely independent from the quality of external clock signals. Intelligent Clock Control not only displays every clock status by means of flashing LEDs, but will also retain the last valid input sample rate in case of failure of the external source. Other renowned RME technologies like SyncCheck allow quick detection of clock problems. Both converters have optical and coaxial MADI inputs. In case of failure of an input signal, the source is switched immediately, if a valid signal is present on the other input. All settings are retained when the unit is powered off.

Remote Control. All M-series converters are fully remote controllable and configurable via MIDI. Each unit's complete status can be monitored, including all the front panel's displays. Individual IDs can be set for each unit, allowing separate controllability of several units with a single MIDI channel. Control software for Mac and PC is supplied and allows easy remote control, also with MIDI transfer via MADI (MIDI Extender).

ADAT. The M-32 AD's four ADAT inputs provide simple connectivity with other studio equipment. A combination with RME's HDSPe RayDAT makes a perfect partnership, allowing the transfer of 32 channels from a Mac or PC with regular optical Toslink cables at an unbeatable price.

Stacking. The MADI input serves not only as audio source and optional external clock source, but also as MADI passthrough input. Since the M-32 DA converts only 32* channels of the MADI signal, all channels of the input signal are fed back to the output. Additional M-32 DA or M-16 DA can be connected to convert the remaining signals, in any combination up to a maximum of 64 channels: One M-32 DA with one or two M-16 DA or up to four M-16 DA. And as MADI can cover long distances up to 2 km, even the same channels can be converted in several different (electrically separated) locations, with comfortable and unambiguous front panel channel selection.

Delay Compensation. Serial connection of devices via MADI will cause a delay of 3 samples from MADI input to output, thus the MADI signals of preceding converters will arrive delayed at the input of the last unit in the chain. The M-series includes an internal autocorrection, which ensures sample-synchronous data at the last unit's output.

Features

- 32-channel* DA converter, double balanced output, 118 dBA
- 19" enclosure with only 2 units height
- 32* LED level meters with 6 LEDs each
- SteadyClock™ - prestine sound quality independently from the quality of the external clock signal
- SyncCheck® - unique technology to check clock synchronization
- Noise suppression on power-on and power-off at the analog outputs
- All settings are stored permanently
- Fully remote controllable via MIDI and MADI

* M-16 DA: 16 channels

The M-16 DA is fully identical to the M-32 DA, with these exceptions:

- only one 16-channel DA board fitted
- no fan
- lower power consumption, 40 Watts

Specifications

- Output DA: 1/4"TRS jack servo balanced, up to +21 dBu. 25 pin D-sub, balanced, up to +24 dBu.
- Dynamic Range DA (SNR): 114 dB RMS unweighted, 118 dBA
- THD DA: < -104 dB (< 0.00063%)
- THD+N DA: < -100 dB (< 0.001%)
- Frequency response DA, -0.5 dB: 5 Hz - 22 kHz (sf 48 kHz)
- Frequency response DA, -0.5 dB: < 5 Hz - 34 kHz (sf 96 kHz)
- Frequency response DA, -1 dB: < 5 Hz - 50 kHz (sf 192 kHz)
- Input level for 0 dBFS: +24 dBu, +19 dBu, +13 dBu
- Sample rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (Sync/WC)
- Jitter: Typical < 1 ns for internal, Word Clock, ADAT and MADI input
- Jitter suppression: >30 dB (2.4 kHz)
- Jitter sensitivity: all PLLs operate error-free even at 100 ns
- Power supply: Internal switching mode PS, 100V - 240V AC, 60 Watt
- Dimensions: (WxHxD) 483 x 88 x 200 mm

ADI-8 QS

8-Channel 192 kHz AES/EBU . ADAT . MADI AD/DA converter

Connectivity

8 x Analog I/O (balanced TRS and 25-pin D-sub, up to +24 dBu)

4 x AES/EBU I/O (25-pin D-sub) 8 ch. @ 192 kHz

2 x ADAT Out (TOSLINK) 8 ch. @ 96 kHz (S/MUX), 4 ch. @ 192 kHz (S/MUX4)

optional: 1 x MADI I/O coaxial and optical with I64 MADI Card (ADI-8 QSM)

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

external Remote Controller (Volume, Dim, Preset)

The ADI-8 QS is a highly flexible 8-channel AD/DA converter and digital to digital format converter with an unrivalled bunch of features. The device combines excellent analog circuit design with outstanding low latency AD/DA converter chips. Along with SteadyClock, the QS offers AD and DA conversion of the highest quality, redefining the reference class of analog/digital converters.

The compact 1U device provides a host of extraordinary features, including analog and digital limiter, 4 hardware reference levels up to +24 dBu, AES/EBU and ADAT I/O, optional MADI I/O, remote control via MIDI, digital input trimming for full input calibration, volume control for all 8 analog outputs, either separately, globally or ganged, and much more.

The ADI-8 QS uses a completely symmetrical signal path (including limiter) that guarantees an exceptional sound quality, outstanding low distortion and highest Signal to Noise ratio in all level settings. One of the main issues when working with an AD converter is to maintain the full dynamic range within the best operating level. Therefore the ADI-8 QS internally uses hi-quality electronic switches, which introduce no additional noise or distortion to the audio path. The latest generation AD/DA converters provide samplerates up to 192 kHz with a SNR of 120 dBA. On the digital side, SteadyClock™, RME's unique clock technology and jitter suppression, further enhances the list of features, ensuring the best sound quality regardless of the quality of the reference clock signal. Of course other typical RME features such as Intelligent Clock Control (ICC), SyncCheck® and SyncAlign® have also been implemented.

The ADI-8 QS offers an unsurpassed choice of interface options:

2 ADAT I/Os support up to 8 channels at 96 kHz (S/MUX) and 4 channels at 192 kHz (S/MUX4). A 25-pin AES/EBU interface features 8 channels at 192 kHz. All outputs can be used simultaneously, i. e.: analog (balanced TRS and/or D-sub), ADAT, AES/EBU. RME's I64 option provides the QS with a 64-channel MADI input and output. Coaxial and optical output operate in parallel to the AES/EBU and ADAT output, therefore deliver the same data. Up to 8 ADI-8 QS or other RME MADI devices can thus be combined into one single MADI stream.

Low Latency. The biggest difference to other ADCs is the innovative digital filter, achieving for the first time a delay of only 12 samples in Single Speed (0.25 ms), 9 samples in Double Speed (0.09 ms), and 5 (!) samples in Quad Speed (0.026 ms). These values are less than a quarter of those available from even much more expensive devices. They represent an important step in further reducing the latency in the computer-based recording studio. At DS and QS the added latency can simply be ignored. The DA-converter offers similar conversion in the range of 5 to 10 samples, turning analog digital monitoring into real analog-style monitoring.

RME's high-end reference converter. Highest performance in every detail.

Technologies

MIDI Remote
MIDI over MADI
Intelligent Clock Control
ADAT S/MUX and S/MUX4
FlexGain™
I64 Option Slot™
SteadyClock™
SyncCheck®
SyncAlign®
TotalRemote™
incl. Remote Controller
Cascadable

Limiter. The integrated limiter is available as analog, digital or combined, avoiding not only extreme overload effects, but also prevents the AD converters from being damaged.

Analog Outputs. The ADI-8 QS' has separated driver stages for the TRS and D-sub outputs. The servo-balanced TRS jacks will work up to +21 dBu. When selecting +24 dBu the balanced D-sub connector outputs will provide the higher output level while TRS stays at the +19 dBu setting.

Remote Control. All functions of the QS can be controlled via MIDI, or MIDI over MADI. This way, the device can be placed anywhere on stage or in the studio – with full control from the control room or FOH mixer.

MADI. The I64 MADI Card provides the ADI-8 QSM with a 64-channel MADI input and output. The optional card features an optical and a coaxial MADI input. The input is switched automatically, according to where a valid input signal is detected. Full redundancy is ensured by the automatic input switching, immediately changing to the other input in case of loss of the input signal.

The MADI I/O provides serial pass-through capability from one ADI-8 QSM to the next (up to 8). Since each QSM uses only 8 channels, up to 56 channels can be passed through. The device ID determines which MADI channels the ADI-8 QS will use. All 64 combined channels are available at the last device's output.

Cascading is of possible between several ADI-8 QSM and other RME MADI devices, like Micstasy or DMC-842.

Features

- 8-channel AD converter, full symmetrical design, 117 dBA SNR
- 8-channel DA converter, DC-coupled signal path, double balanced output, 120 dBA SNR
- Low latency conversion: only 8 samples delay!
- 2 ADAT optical inputs, 24 bit, with RME's unsurpassed Bitclock PLL, up to 192 kHz
- 2 ADAT optical outputs, 24 bit, fully compatible, up to 192 kHz
- 8 AES/EBU I/Os, full channel count up to 192 kHz, 24 bit, connected via D-sub
- Digital input/output trim, range 6 dB per I/O
- Analog and digital limiter for AD conversion
- 16 LED level meters with 7 LEDs each
- SteadyClock™ - prestine sound quality independently from the quality of the external clock signal
- SyncCheck® - unique technology to check clock synchronization
- Noise suppression on power-on and power-off at the analog outputs
- integrated Dim function (-20 dB)
- Hardware remote control for store/recall of presets, volume and dim
- All settings are stored permanently
- Fully remote controllable via MIDI and MIDI over MADI
- I64 Option Slot for optional I64 MADI module

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Analog Input Sensitivity

8-Channel Limiter

Available as analog, digital or combined, for all channels.

Remote, Clock, State

Direct access for remote source, clock reference, frequency multiplier and the digital source signal of the DA-converters.

Analog Output Sensitivity

Input State

Multifunctional 8-level LED display, showing the digital input level per channel (with peak hold) or the input channel setup parameters.

Output State

Multifunctional 8-level LED display, showing the digital input level per channel (with peak hold) or the output channel setup parameters.

MIDI I/O

Used to remote control and transmit MIDI data via MADI.

Remote Connector

for the Hardware Remote Controller

ADAT I/O (TOSLINK)

The optical ADAT I/O provide the same signals as the AES/EBU outputs. The Aux connectors transmit further channels at activated sample multiplexing.

Word Clock I/O

with Input termination

I64 MADI Card (optional)

Coaxial and optical MADI I/O

8 x Analog output section

Balanced Line outputs, available as 1/4"TRS inputs and an alternative 25-Pin D-sub connector.

AES/EBU I/O

The 25-pin D-sub connector provides four stereo AES/EBU outputs (AD signals) and four AES/EBU inputs (DA signals). The high sensitivity type input accepts all common digital sources, even SPDIF.

8 x Analog input section

Balanced Line inputs, available as 1/4"TRS inputs and an alternative 25-Pin D-sub connector.

Specifications

- Dynamic Range AD: 117 dBA
- THD AD: < -110 dB (< 0.00032 %)
- THD+N AD: < -104 dB (< 0.00063 %)
- Crosstalk AD: > 130 dB
- Dynamic Range DA: 120 dBA unmuted
- THD DA: < -104 dB (< 0.00063 %)
- THD+N DA: < -102 dB (< 0.0008 %)
- Crosstalk DA: > 110 dB
- Input level for 0 dBFS: +24 dBu, +19 dBu, +13 dBu, +4.2 dBu, each adjustable by 6 dB in steps of 0.5 dB via Digital Input Trim
- Output level for 0 dBFS: +24 dBu, +19 dBu, +13 dBu, +4.2 dBu, each adjustable by +/- 6 dB in steps of 0.5 dB
- Output level global: 0 down to -96 dB in 48 steps
- Sample rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (sync/word)
- Frequency response AD/DA, -0.1 dB: 10 Hz - 23.2 kHz (sf 48 kHz)
- Frequency response AD/DA, -0.5 dB: < 5 Hz - 44.6 kHz (sf 96 kHz)
- Frequency response AD/DA, -1 dB: < 5 Hz - 63.4 kHz (sf 192 kHz)
- Power supply: Internal switching mode ps, 100 V-240 V AC
- Dimensions (WxHxD): 483 x 44 x 200 mm

ADI-192 DD

8-Channel 192 kHz AES/EBU . ADAT . TDIF Format / Sample Rate Converter

The perfect match: This outstanding device consists of three 8-channel format converters with AES/EBU, ADAT and TDIF I/Os. Switchable 192 kHz sample rate converters allow 8-channel sample rate conversion and clock decoupling of the highest quality.

The ADI-192 DD offers full 24 bit audio resolution at any sample rate. The three output formats ADAT, TDIF and AES independently access the three input formats ADAT, TDIF and AES. Thanks to free selection of inputs, signals can be copied and distributed between all connected devices - without the need to change any cables.

Four XLR AES/EBU inputs and outputs each, and two ADAT and TDIF inputs and outputs allow full 8-channel operation even at 96 kHz with 24 bit resolution. At 192 kHz, there are eight AES channels and four ADAT and TDIF channels. Switchable 192 kHz sample rate converters allow 8-channel sample rate conversion and clock decoupling of the highest quality.

The ADI-192 DD supports Double Wire, Quad Wire, S/MUX and S/MUX4, making it compatible with all methods of increasing sample rates for high-class recordings by sample multiplexing on all platforms. The unit can also convert between these formats, even along with SRC. If more than 8 channels are required, several units can be cascaded and synchronized with sample accuracy by Word Clock.

The ADI-192 DD also features an automatic distribution mode. If only one of the four AES inputs is used, the device will copy these two channels to the other three AES outputs.

48 LEDs clearly display the current status of the incoming and outgoing signals and the processing performed within the unit. The AES output signal can be given a "consumer" or "professional" status.

Connectivity

4 x AES/EBU I/O (XLR)

2 x ADAT I/O (optical)

2 x TDIF I/O (D-sub)

1 x SPDIF I/O (optical)

Word Clock I/O

The ADI-192 DD is the all-in-one solution for any format and sample rate conversion, from 2 to 8 channels.

Specifications

- Input AES/EBU: 4 x XLR, transformer balanced, highly sensitive input stage (< 0.3 Vpp), SPDIF compatible, max. 192 kHz Single Wire
- Output AES/EBU: 4 x XLR, transformer balanced, 4.5 Vpp, max. 192 kHz Single Wire
- Input/Output ADAT optical: 2 x TOSLINK, Bitclock PLL
- Input/Output TDIF: 2 x D-sub 25 pin
- Input/Output SPDIF front: 2 x TOSLINK, max. 192 kHz
- Input Word Clock: Signal Adaptation Circuit (functional from 1.2 Vpp)
- Output Word Clock: BNC, low impedance driver stage, 4 Vpp into 75 Ohms, short-circuit-proof
- Sync sources: Internal, ADAT optical in, AES/EBU in, TDIF in, Word Clock in
- Varipitch: by input signal or Word Clock
- Sample frequencies: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (sync/Word Clock)
- Sample rate range: AES, Word Clock: 28 -204 kHz, ADAT/TDIF 30 - 54 kHz
- Jitter: Internal clock < 1 ns, external clocks < 1 ns
- Jitter sensitivity: all PLLs operate error-free even at 100 ns
- Jitter suppression: > 30 dB (2.4 kHz)
- SRC dynamic ratio: 140 dB RMS unweighted, 143 dBA
- SRC THD+N: < -140 dB
- Sample rate ratio: max. 7:1 / 1:7
- Power supply: Internal switching mode PS, 100V - 240V AC, 20 Watt

ADI-6432

Bidirectional 64-Channel 192 kHz MADI ⇔ AES/EBU converter

Connectivity

1 x MADI I/O (optical and coaxial)

32 x AES/EBU I/O (8 x 26-pin D-sub), 64 ch. at 48 kHz

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

Com Port I/O (RS-232 via 9-pin D-sub)

The ADI-6432 converts all 64 channels of a single MADI stream to 32 AES/EBU ports and vice versa. The compact 2U device supports all 64 channels of the MADI format at up to 48 kHz, 32 channels at up to 96 kHz, and 16 channels at up to 192 kHz. Connected to the HDSP(e) MADI card, the ADI-6432 turns into a powerful external AES/EBU interface with up to 32 AES/EBU inputs and outputs. Two units can also serve as perfect digital multicore.

The 32 AES I/Os are available via standard D-sub connectors. 56- and 64- channel MADI formats, both 48k and 96k frame, will be accepted at the input, and can also be sent to the 6432's outputs. All channels are transferred across a single cable, either coaxial (BNC) or optical network cable. In both cases, cable lengths of more than 100 meters can be achieved. The ADI-6432 is of course full compatible to third-party MADI devices.

The front panel features a detailed display with a 97 LED matrix-array for sync, lock and the audio states of all I/Os. Several buttons having clear LED displays ensure an easy and valid configuration of the device. Especially in a professional application, exact display and control of all incoming and outgoing signals, including MIDI and RS232, becomes indispensable. Any error can be detected at a glance. The control keys can be locked to prevent accidental changing of settings.

SteadyClock, a digitally controlled hybrid clock developed especially for MADI, extracts the reference clock from the MADI signal, avoiding extra Word Clock cables. Its efficient jitter suppression allows any clock signal, including AES and Word Clock, to be cleaned up, refreshed and used as reference clock at the Word Clock output. In case of a failure of the input signal, the last valid sample frequency will be retained. The ADI-6432 provides Word Clock as Single, Double and Quad Speed signals, distributes 96 kHz Double Wire signals into the MADI data stream, but will also handle 96k frame (double MADI clock). SyncAlign and SyncCheck, ensures perfect synchronization across all channels, and easy detection of errors.

The ADI-6432 is fully MIDI remote controllable; via the built in MIDI connectors and/or MIDI over MADI. MIDI over MADI allows for 16 MIDI channels to be carried invisible along with the MADI data packages, together with the full 64 audio channels. RS232 over MADI allows for the ADI-6432 to be used as an extender for serial cables, supporting 9600, 19200, 38400 and 115200 Baud, with no effect on the audio functionality.

All settings will be retained even when the unit is switched off. In case of errors, the unit will switch the MADI input automatically, ensuring redundancy between optical and coaxial inputs in critical applications.

The ADI-6432 interfaces to TASCAM (RME) standard 25-pin AES/EBU equipped devices via TASCAM (RME) digital cables. The ADI-6432 AES-ports can also be combined with up to four BOB-32 breakout boxes, allowing compact XLR-connectivity. Please note that your Premium Line dealer offer ALVA Cableware cables also for other pinout standards.

The ADI-6432 offers AES/EBU / MADI interfacing in one compact unit, ensuring full MADI compatibility!

Technologies

MADI Multinorm
MADI Quad Wire
MADI Redundancy
MIDI Remote
MIDI over MADI
RS-232 over MADI
Intelligent Clock Control
SteadyClock™
SyncCheck™
SyncAlign®

Specifications

- Input MADI: 1 x BNC, 1 x optical
- Input AES/EBU: 32 x, 4 x D-sub connector, transformer balanced, highly sensitive input stage (< 0.3 Vpp), SPDIF compatible
- Output AES/EBU: 32 x, 4 x per D-sub connector, transformer balanced, 4 Vpp
- Input Word Clock: BNC, Signal Adaptation Circuit (functional from 1.2 Vpp)
- Output Word Clock: BNC, low impedance driver stage, 4 Vpp into 75 Ohms, short-circuit-proof
- MIDI input and output: via two 5-pin DIN jacks
- COM port: RS232 via 9-pin D-sub, 9600/19200/115200 Baud
- Sync sources: MADI, AES, Word Clock, internal
- Varipitch: by input signal or Word Clock
- Sample frequencies: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (sync/Word Clock)
- Sample rate range: MADI: 32 - 192 kHz, Word Clock: 27 - 200 kHz, AES: 28 - 200 kHz
- Jitter: Internal Clock < 1 ns, Word Clock In < 2 ns, AES/EBU In < 2 ns
- Jitter suppression: > 30 dB (2.4 kHz)
- Jitter sensitivity: all PLLs operate error-free even at 100 ns
- Power supply: Internal switching mode PS, 100V - 240V AC, 20 Watt
- Dimensions: (WxHxD) 483 x 88 x 200 mm

ADI-642

8-Channel 192 kHz MADI ⇔ AES/EBU converter with 72 x 74 Routing Matrix

Connectivity

1 x MADI I/O (optical and coaxial)

4 x AES/EBU I/O (XLR)

1 x Stereo Analog Out (Phones)

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

Com Port I/O (RS-232 via 9-pin D-sub)

The ADI-642 perfectly integrates AES/EBU in any MADI system. This hi-end format converter from MADI to AES/EBU and vice versa features flexible routing options via an easy-to-use 72x74 routing matrix, allowing free configuration of all MADI and AES/EBU channels. The ADI-642 not only offers superior I/O flexibility but also seamless integration of high-class digital effect units in any MADI system.

The ADI-642's MADI interface handles 64 channels of 24 bit audio at sampling frequencies of up to 48 kHz, 32 channels up to 96 kHz, and 16 channels up to 192 kHz. The AES/EBU channels use 4 XLR inputs and outputs respectively.

The MADI input is compatible to 56- or 64-channel formats as well as 48 kHz and 96 kHz frame formats, it's MADI output user-configurable. Therefore the unit can also operate as translator between otherwise incompatible MADI devices. Status displays provide information about synchronization, audio activity and physical quality of the input signal.

The SyncAlign® and SyncCheck® technology ensures perfect synchronization and clear detection of errors. Up to 8 devices can be cascaded and synchronized with sample accuracy via Word Clock. Automatic Delay Compensation eliminates technically inherent delays, when signals are transferred from one unit to another. Each device automatically recognizes its position within the chain, and corrects the AES input and output data so that all AES I/Os operate sample-aligned.

The ADI-642 features an easy-to-use 72 x 74 Matrix Router. Any input signal can be assigned to every output channel, both for AES and MADI. This not only allows free signal routing during format conversion, but also forwarding and routing of signals within the same format. An input signal can also be distributed to any number of outputs. With more than one ADI-642, several MADI signals can be mixed into one MADI stream.

The ADI-642 is fully MIDI remote controllable; via the built in MIDI connectors and/or MIDI over MADI. MIDI over MADI allows for 16 MIDI channels to be carried invisible along with the MADI data packages, together with the full 64 audio channels. RS232 over MADI allows for the ADI-6432 to be used as an extender for serial cables, supporting 9600, 19200, 38400 and 115200 Baud, with no effect on the audio functionality.

RME's SteadyClock enables the ADI-642 to be operated without additional Word Clock connection, providing excellent clock quality in every situation. In case of errors, the MADI input automatically changes, ensuring redundancy between optical and coaxial inputs.

Due to the efficient jitter reduction, any clock signal (even AES and Word Clock) can be improved, refreshed, and subsequently used as a reference clock at the Word Clock output. Intelligent Clock Control™ (ICC) retains the last valid sample frequency, even in cases where loss of input signal occurs.

The perfect AES/EBU front-end for RME's MADI devices. An ideal digital multicore, allowing AES/EBU signal transfer across long distances with a single MADI cable. MADI redistributor, patchbay and router . MADI coaxial/optical converter in both directions.

Technologies

MADI Multinorm
MADI Quad Wire
MADI Redundancy
MIDI Remote
MIDI over MADI
RS-232 over MADI
Intelligent Clock Control
SteadyClock™
SyncCheck™
SyncAlign®
Cascadable

The analog stereo monitor output can be used as both line and headphone output. The routing matrix can assign any of the 36 stereo input pairs to this monitor output.

Auto Delay Compensation . A typical application example is the use of a HDSP MADI PCI-card in a computer with the ADI-642 as external AES interface. As MADI transmits 64 channels, up to eight ADI-642 can be used to provide all 64 channels via 32 AES I/Os. The integrated Matrix Router makes such a setup easy to be configured. The MADI signal is passed through from device to device. When passing through the MADI signal, a delay of a few samples per ADI-642 occurs, causing the AES inputs and outputs to show an offset. This problem is fixed by the Automatic Delay Compensation. Each ADI-642 automatically detects which unit it is within the chain, and corrects the AES input and output data so that all AES I/Os operate sample aligned. The additional Auto Configuration mode sets up all ADI-642 to use consecutive AES I/Os. A manual configuration via each unit's Matrix is not required.

Specifications

- Input/Output MADI: 1 x BNC, 1 x optical
- Input AES/EBU: 4 x XLR, electrically isolated, highly sensitive input stage (< 0.3 Vpp), SPDIF compatible
- Output AES/EBU: 4 x XLR, transformer balanced, 5 Vpp
- Input Word Clock: BNC, Signal Adaptation Circuit (functional from 1.2 Vpp)
- Output Word Clock: BNC, low impedance driver stage, 4 Vpp into 75 Ohms, short-circuit-proof
- MIDI input and output: via two 5-pin DIN jacks
- Sync sources: MADI, AES, Word Clock, internal
- Varipitch: by input signal or Word Clock
- Sample frequencies: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (sync/Word Clock)
- Sample rate range: MADI: 32 - 192 kHz, Word Clock: 27 - 200 kHz, AES: 28 - 200 kHz
- Jitter: Internal clock < 1 ns, external clocks < 1 ns
- Jitter suppression with external clock: > 30 dB (2.4 kHz)
- Jitter sensitivity: all PLLs operate error-free even at 100 ns
- Power supply: Internal switching mode PS, 100V - 240V AC, 20 Watt
- Dimensions: (WxHxD) 483 x 44 x 200 mm

ADI-648

64-Channel 192 kHz ADAT ⇔ MADI converter with 16 x 16 matrix router

Connectivity

1 x MADI I/O (optical and coaxial)

8 x ADAT I/O (TOSLINK), 4 ch. @ 96 kHz (S/MUX), 2 ch. @ 192 kHz (S/MUX4) each

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

The ADI-648 offers format conversion from MADI to ADAT and vice versa. All 64 MADI I/O-channels can be converted to 8 ADAT optical TOSLINK inputs and outputs respectively. In addition, the ADI-648 features an easily configurable 8-channel based 16 x 16 Matrix Router. Any of the outputs, which are divided into 8-channel blocks, can be fed from any 8-channel input block, both on the ADAT and the MADI side.

The ADI-648 not only accepts 56-channel, 64-channel and 96k frame formats, it is also capable of generating and supplying those formats. That way the ADI-648 makes an ideal MADI front-end for ADAT devices. Interconnecting ADAT equipped computers or mixers will be more comfortable and powerful by bypassing limitations of the short cable-lengths offered by the ADAT-optical standard.

But it doesn't stop at free routing within the MADI-ADAT and ADAT-MADI conversion. Splitting and routing is also possible within the same format. An 8-channel input block can also be mirrored to any number of output blocks in parallel.

Multiple ADI-648 devices can be cascaded and synchronized with sample accuracy via Word Clock.

The ADI-648 generates Word Clock in Single or Double Speed and is capable of working with double MADI rate (96k frame). 96 kHz and 192 kHz sample rate are supported in Double Wire (S/MUX)/Quad Wire (S/MUX4) mode, both, for MADI and ADAT I/O. The Varipitch option is controlled by input signal or Word Clock.

The ADI-648 is fully MIDI remote controllable via the built-in MIDI connectors and MIDI over MADI.

The device status, controls and front panel LEDs can be scanned and controlled via MIDI. Each ADI-648 can be given its own ID, providing independent remote control of multiple devices via a single MIDI channel. RME´s MIDI Remote control software for Mac and PC may use any existing MIDI port within the computer to perform remote control and status requests for all ADI-648s.

MIDI over MADI allows for 16 MIDI channels to be carried along with the MADI data packages, not interfering any of the 64 audio channels.

The ADI-648 supports SyncAlign® and SyncCheck® – known and proven technologies utilized in other RME products, allowing for perfect sync between all channels and easy detection of error states.

All settings are retained when the unit is powered off. Due to SteadyClock and its high jitter suppression, the reference clock can also be extracted from the MADI signal itself. No need for additional Word Clock or AES clock lines.

In case of errors, the Safe Mode Input function will switch the MADI input automatically, ensuring redundancy between optical and coaxial inputs.

With its 16 ADAT ports the ADI-648 performs a full integration of the most popular interface standard into the MADI world, with just a single device.

Technologies

MADI Multinorm
MADI Quad Wire
MADI Redundancy
ADAT S/MUX and S/MUX4
MIDI Remote
MIDI over MADI
Intelligent Clock Control
SteadyClock™
SyncCheck™
SyncAlign®
Cascadable

Application examples

- MADI-ADAT breakout box for all RME analog/digital front-end units
- MADI-ADAT breakout box for other devices with MADI interface
- Connecting MADI-based equipment to RME's Hammerfall series
- ADAT optical patchbay and router
- MADI coaxial / optical or vice versa converter and splitter
- MADI redistributor, patchbay, router

Specifications

- Sample rates: 44.1, 48, 88.2, 96 kHz, variable (Sync/Word Clock)
- Frame rate MADI: 48 and 96 kHz (for 88.2 and 96 kHz sample rate)
- Input Word Clock: Signal Adaptation Circuit (functional from 1.2 Vpp input signal), switchable termination
- Output Word Clock: low-impedance driver stage, 4 Vpp into 75 Ohm, short-circuit-proof
- Sync sources: MADI, ADAT optical, Word Clock, internal
- Varipitch: controlled by input or Word Clock
- Sample rate range: MADI: 32 - 96 kHz, Word Clock: 27 - 105 kHz, ADAT: 33 - 57 kHz
- Jitter: Internal clock < 1 ns, word clock In < 2 ns, ADAT In < 2 ns
- Jitter suppression with external clock: > 30 dB (2.4 kHz)
- Jitter sensitivity: flawless PLL operation even at 100 ns Jitter
- Power Supply: Internal switching power supply, 100 V - 240 V AC, 15 Watt
- Dimensions (WxHxD): 483 x 44 x 200 mm

MADI Bridge

Multi-Channel MADI Switcher and Router with 8 x 8 MADI matrix

Connectivity

6 x MADI I/O (coaxial)

2 x MADI I/O (optical)

MIDI I/O (5-pin DIN)

The MADI Bridge complements RME's MADI series with a convenient device manager. As a patchbay, distributor, signal buffer and an input selector, it links MADI devices from all manufacturers. Featuring 6 coaxial inputs and 6 coaxial outputs, as well as 2 optical inputs and outputs, it interconnects up to 16 devices. Thanks to its clear design, it is intuitively operable and can easily be handled. Application examples include 8 x 8 MADI matrix, dual MADI coaxial/optical and vice versa converter and distributor.

All MADI input streams are routed unaltered to the selected MADI outputs without any reprocessing. Therefore the MADI Bridge supports any format, be it 56- or 64-channel modes or special invisible control commands that might be included in the MADI data. The MADI Bridge transmits any sample rate, even out-of-spec data rates or even non-standard MADI protocols. Thanks to a special equalizing and highly sensitive input stages, coaxial cable lengths up to 100 m can be used - even between several devices.

Eight numerical LED displays on the front panel indicate the current signal source for each output. These can be changed instantly with two dedicated buttons. Any input can be assigned to either one or several outputs, turning the unit into a MADI distributor. To prevent accidental operating errors, both the buttons on the device itself and the MIDI remote control function can be deactivated.

The current settings are memorized and can be stored to one of 9 presets. Preset 0 serves as a panic/off button and mutes all external connections. A preset can been selected and then activated with the Recall button. In addition, the current state of the routings is clearly displayed in a 64-LED matrix on the front panel of the unit. Due to its classic cross-matrix layout, any configuration can be verified at a glance – even before a preset is active, as the routing of a preset is already displayed on selection, i. e. prior to its actual recall.

The MADI Bridge can be remote controlled via MIDI. Also all controls and LEDs on the front plate - the complete status - can be read via MIDI. Each MADI Bridge can be programmed with its own ID, providing a separated remote control of multiple devices via a single MIDI channel. RME provides a MIDI Remote software for Mac and PC. It uses any existing MIDI port within the system to perform remote control and status requests of all MADI Bridges via a simple mouse click.

For applications with a demand for highest redundancy options the MADI Bridge can be combined with RME´s MADI Converter, which even expands the I/O connectivity with coaxial and optical I/Os.

The MADI Bridge can handle up to 8 MADI I/O streams in a compact device - providing the power to direct, distribute or mirror all audio information - transferring up to 1024 audio channels within one programmable I/O matrix.

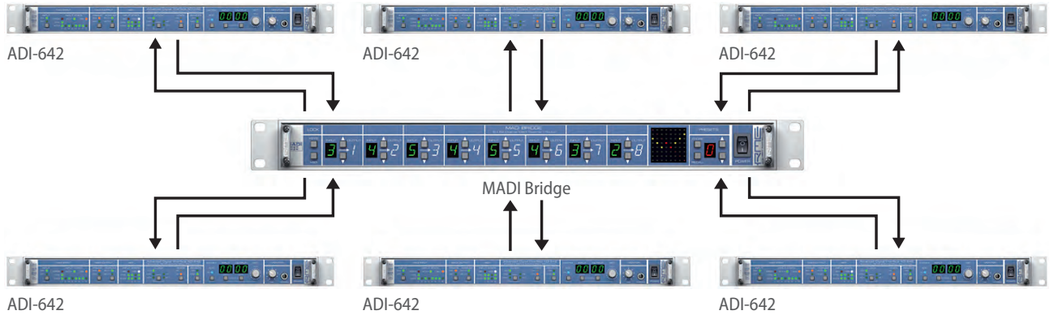
Technologies

MADI Multinorm

MIDI Remote

Example for an audio ring system

Compared to the MADI Ring Installation example (see example on the last pages), the MADI Bridge can be perfectly used to setup a fault-tolerant audio ring system. This is achieved easily by passing on the MADI signals, like shown in the example below:



Specifications

- Input MADI: 6 x BNC, 2 x optical (SC)
- Output MADI: 6 x BNC, 2 x optical (SC)
- MIDI input and output: via two 5-pin DIN jacks
- Sync: Not required
- Sample rates: any
- Power supply: internal switching mode ps, 100 V-240 V AC, 50-60 Hz, 15 Watts
- Dimensions: 483 x 44 x 200 mm

MADI Converter

6-fold MADI Optical-BNC/BNC-Optical converter

Connectivity

6 x MADI I/O (optical and coaxial)

1 x MIDI Input (5-pin DIN)

3 x MIDI THRU

RME's MADI Converter converts MADI digital audio streams from optical format to coaxial and from coaxial to optical. The compact 1U device provides 6 bi-directional converters, operating fully independently. Any input signal will pass through absolutely unaltered. The MADI converter is the perfect companion to RMEs MADI Bridge. Its six coaxial inputs and outputs can be converted to optical, which is advantageous in live and installed setups, and for longer cable lengths.

The MADI converter operates with any MADI format, be it 56-channel, 64-channel, and with any sample rate, even out-of-spec rates, and transfers embedded control data unchanged. Special equalization and highly sensitive input stages allow distances of up to 100 m with coaxial cables. Up to 2000 m can be covered with optical cables. The MADI Converter uses adapted termination and a special equalizing, to reach higher cable lengths despite its simpler design. The MADI Converter can even serve as cable buffer for the limited outputs of some manufacturers (90 meter coaxial instead of 30 meter). Real world tests with MADI devices of various manufacturers confirmed the outstanding performance of the MADI Converter.

The MADI Converter is easy to operate. All 12 inputs are equipped with status LEDs on the front panel.

Additionally, a built in MIDI distributor allows copying the MIDI input signal to three MIDI outputs. Several devices can be controlled without an external MIDI distributor.

MADI Bridge and MADI Converter are perfectly designed for each other. In case the Bridge is placed above the Converter, the coaxial BNC inputs and outputs of the two devices will be right next to each other vertically, and can be connected with short patch cables. In this combination, the MADI Bridge effectively offers eight optical I/Os. Thanks to interchanged inputs and outputs, the cabling is done without crossing and cluttering, maintaining perfect overview.

MADI Bridge

MADI Converter

The MADI Converter supports all MADI standards and is the ideal companion to RME's MADI Bridge.

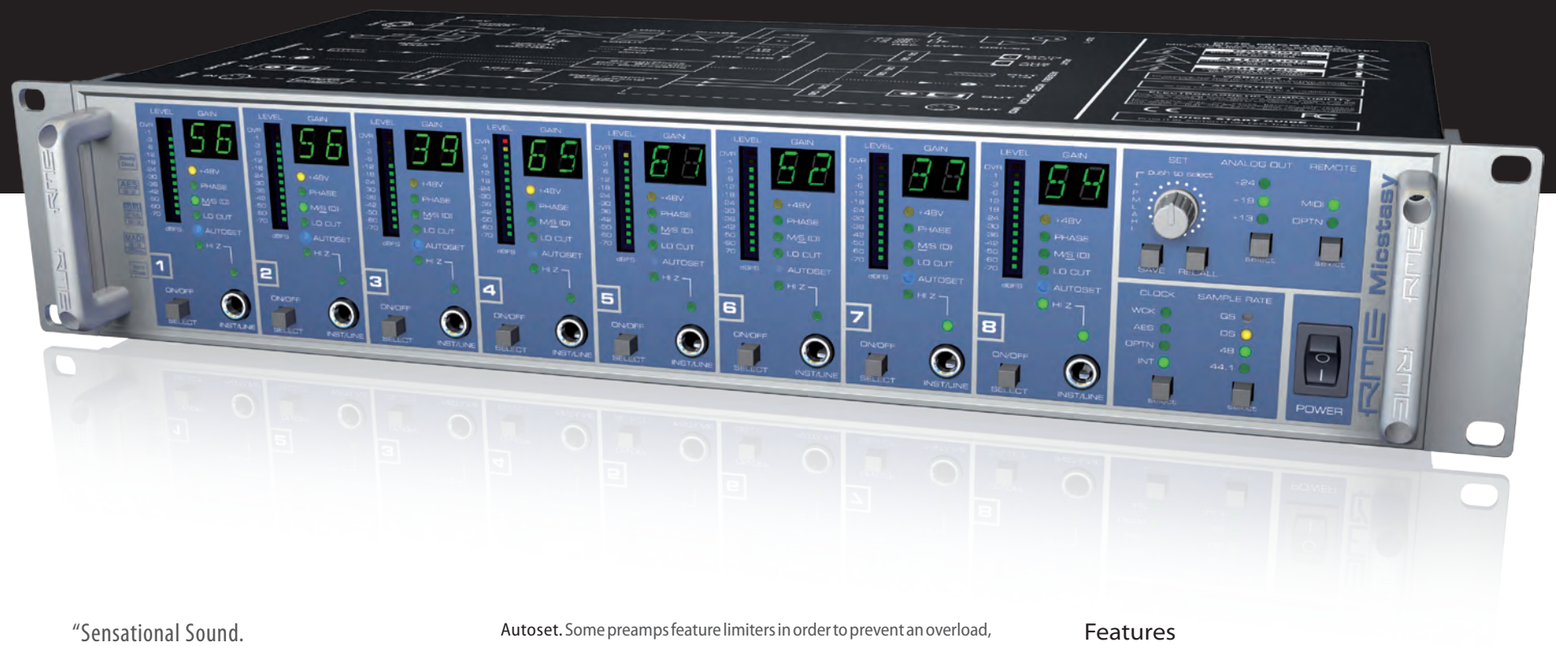
The specially developed internal high performance switching power supply allows operation of the MADI Converter with voltages ranging from 100 to 240 Volts AC. It is short-circuit-proof, has an integrated line filter, is fully regulated against voltage fluctuations, and suppresses mains interference.

Specifications

- Sync: Not required
- Varipitch: Yes
- Samplerate: Any sample rate
- Power Supply: Internal switching power supply, 100 V - 240 V AC, 15 Watts
- Dimensions: (WxHxD) 483 x 44 x 200 mm

Micstasy

8-Channel Full Range 192 kHz Preamp / AD converter



Connectivity

8 x Analog Mic / Line Preamp Input (XLR/Line TRS)

8 x Analog Output (XLR)

4 x AES/EBU Out (25-pin D-sub - 8 channels @ 192 kHz)

1 x AES/EBU In (for Synchronization, 25-pin D-sub)

2 x ADAT Out (TOSLINK) 8 ch. @ 96 kHz (S/MUX), 4 ch. @ 192 kHz (S/MUX4)

optional: 1 x MADI I/O coaxial and optical with I64 MADI Card (Micstasy M)

MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

The Micstasy is an 8-channel hi-end mic/line/instrument preamp and AD converter combining typical RME features with a number of previously unseen features. Along with SteadyClock, the Micstasy not only offers low latency AD conversion of the highest quality, but is also fully remote-controllable via MIDI and also MIDI over MADI.

Universal input device. The Micstasy's innovative concept allows for amplification and digitization of all analog signal sources, including high level stage signals, typical studio signals, lower level and high-impedance instruments, or dynamic, condenser or ribbon microphones. The impressive 85 dB gain range, digitally controlled in steps of 0.5 dB, allows connection of all conventional analog studio signals within a range of -56 dBu up to +30 dBu. The analog outputs can be set to a max. level of +27 dBu. The amplified signals are also available at the analog outputs for passing them on, making an expensive splitter box on stage obsolete. The Micstasy can be used analog (Mic/Line In to Line Out) and digital (Mic/Line In to Digital Out), with both signal paths operating simultaneously. The options, Phantom Power (+48 V), Phase, Lo Cut, M/S-encoding (digital only), Input Selection, Hi-Z and AutoSet can be switched for each channel individually.

Low Latency. The Micstasy uses high-class AD converters, offering exceptional Signal to Noise and distortion figures. An innovative digital filter, achieving for the first time a delay of only 12 samples in Single Speed (0.25 ms), 9 samples in Double Speed (0.09 ms), and 5 (!) samples in Quad Speed (0.026 ms). These values are less than a quarter of those available from even much more expensive devices. They represent an important step in further reducing the latency in the computer-based recording studio. At DS and QS the added latency can simply be ignored. And with the ADI-8 QS, a matching DA-converter with only 5 up to 10 samples delay will turn 'analog digital monitoring' into real analog-style monitoring.

Technologies. The Micstasy offers numerous extraordinary features. SyncCheck ensures perfect synchronization and clear detection of errors. Also multiple units can be stacked and operated sample-aligned, using Word Clock. All settings are stored when the unit is switched off. RME's SteadyClock guarantees excellent clock quality in any situation. Due to the highly efficient jitter reduction, the Micstasy's AD converters operate independently from the quality of the external clock signal, as if they are working with internal clock all the time - guaranteeing a prestine sound quality! Additionally Intelligent Clock Control will retain the last valid sample frequency in case of a loss of the input signal.

Remote Control. One of Micstasy's outstanding features is its full remote controllability. All functions can be controlled via MIDI or MIDI over MADI, allowing the device to be placed anywhere on stage or in the studio – with full control from the studio or FOH mixer. This means that microphone cables can be relatively short, ensuring high quality signals without interference.

"Sensational Sound. Unique ease of use. ... one of the best preamps we´ve ever tested."

Professional Audio Magazin

Technologies

MIDI Remote
MIDI over MADI
Intelligent Clock
ADAT S/MUX and S/MUX4
Autoset
I64 Option Slot™
SteadyClock™
SyncCheck®
SyncAlign®
TotalGain™
Cascadable

Autoset. Some preamps feature limiters in order to prevent an overload, especially of the AD converter. This is not feasible for the Micstasy, as such a limiter would ruin the excellent technical specifications of the microphone front end. But as the Micstasy's gain is controlled completely digitally, the device can set it automatically, thus providing perfect protection from overload with no degradation of the audio signal, which does not have to pass any additional electronic circuitry. And the gain can still be changed manually.

Example: In an orchestral recording session, the user sets all channels to 60 dB gain and asks the conductor to let the orchestra play fortissimo. AutoSet will automatically adjust the levels by reducing the gain. In AutoSet mode a "threshold" can be set to define an overhead of -1, -3, -6, or -12dB. Additionally, a special downlink function allows to group channels for AutoSet mode (e.g. for Stereo- or Surround-Microphone systems). Manual gain adjustment thus becomes obsolete most of the time.

MADI. The I64 MADI Card provides the Micstasy with a 64-Channel MADI input and output. Coaxial and optical output operate in parallel to the AES/EBU and ADAT output, therefore deliver the same data. The I64 MADI Card features an optical as well as a coaxial MADI input and provides serial pass-through capability from one Micstasy to the next (up to 8). Such a way of cascading is also possible between Micstasy and other RME MADI devices, like the ADI-8 QS.

Furthermore the I64 MADI Card provides the ability of 8 channels being used as digital return path, sending audio via MADI to the Micstasy's ADAT and AES outputs. For example stage and studio monitors can be fed digitally from the Micstasy. On stage the use of an additional D/A-converter (e. g. ADI-8 DS) might be necessary.

Features

- 85 dB gain range
- High-end circuitry with 4 relays per channel,
- Super-low-noise microphone front end
- Symmetrical Super-Low THD Lo Cut filter, 18 dB/oct
- Balanced front panel line input on each channel
- Hi-Z front panel instrument input on each channel
- LED level display with 13 LEDs per channel and Peak Hold function
- Single, ganged or all-relative gain control
- Minimized noise at the analog outputs when powering the device up or down
- Current device configuration storable to 8 presets
- Full remote controllability
- M/S Encoding (digital only)
- Automatic gain reduction when AutoSet mode is active; adjustable headroom of 1, 3, 6 or 12 dB

For technical specifications please continue on next page

8 x Analog line/instrument inputs

50 dB gain range and Hi-Z option. Works with balanced and unbalanced TRS and TS plugs.

8 x Channel strip

Level meter with Peak hold function.

Status LEDs for all channel functions.

Multifunctional rotary controller

for direct access to all functions.

Analog outputs reference level and remote mode controls.

MIDI I/O

Used to remote control and transmit MIDI data via MADI.

I64 MADI Card (optional)

Coaxial and optical MADI I/O

8 x Analog line outputs

Eight balanced XLR line outputs with up to +27 dBu level.

Word Clock I/O

ADAT Output (TOSLINK)

Provide the same signals as the AES/EBU outputs, but in ADAT format.

AES/EBU I/O

The 25-pin D-sub connector provides four outputs (AD signals) and one input for clock synchronization. Wired in the widely spread Tascam standard.

8 x Analog Microphone/Line inputs

Balanced XLR full range inputs with 85 dB gain range.

Specifications

- SNR: 129 dB EIN @ 150 Ω
- THD: < 0.006% @ 30 dB gain
- Frequency response: 5 Hz - 200 kHz, - 0.5 dB
- Gain: 0 - 85 dB
- Inputs mic/line rear: XLR, servo-balanced, full gain range
- Analog input level: -55 dBu - +30 dBu
- Inputs TRS jacks front panel: servo-balanced, max. +24 dBu, Impedance switchable: 10 kΩ / 470 kΩ
- Outputs: XLR balanced, up to +27 dBu
- Analog output level: typical +24 dBu, +19 dBu, +13 dBu
- Power supply: Internal switching power supply 100 V - 240 V AC, 60 Watt
- Dimensions (WxHxD): 483 x 88 x 200 mm

A/D conversion

- Dynamic AD: 120 dBA
- THD AD: < -110 dB (< 0.00032 %)
- THD+N AD: < -104 dB (< 0.00063 %)
- Crosstalk AD: > 130 dB
- Sync sources: AES, Word Clock, internal, optional MADI
- Sample rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz,
- Variable (Sync/Word Clock)
- Frequency response -0.1 dB: 5 Hz – 21.5 kHz (sf 48 kHz)
- Frequency response -0.5 dB: < 5 Hz – 44.8 kHz (sf 96 kHz)
- Frequency response -1 dB: < 5 Hz – 70 kHz (sf 192 kHz)

OctaMic II

8-Channel 192 kHz Preamp / AD converter

The OctaMic II provides 8-Channel 192 kHz / 24 bit AD conversion with eight hi-class microphone and line pre-amplification channels, featuring a combination of sophisticated components and approved RME technology. Lowest distortion, excellent signal to noise ratio and perfectly linear frequency response transmit and amplify the microphone signals truly unchanged.

OctaMic II offers 8 balanced XLR mic / line inputs via Neutrik XLR/TRS combo jacks. Each channel contains switches for 48V phantom power, a low cut filter and phase reversal. Amplification can be set between 6 and 60 dB. LEDs for signal, clip, and activated phantom power give a complete overview on the unit's status. When the special Clip Hold mode is activated, any detected clipping will cause the corresponding LED to flash once per second. With this, the user gets a long-term peak detection, and no longer needs to constantly watch the LEDs. At the same time momentary overloads are still displayed correctly. The balanced line level output signal is available at the back of the unit via 8 stereo TRS jacks.

The specially developed, internal hi-performance switch mode power supply lets the OctaMic II operate in the range of 100V to 240V AC. It´s short-circuit-proof, has an integrated line filter, is fully regulated against voltage fluctuations, and suppresses mains interference. The 8-channel AD conversion of the OctaMic II operates at up to 192 kHz. The digitized signal is available simultaneously at the double ADAT output (S/MUX, up to 96 kHz), and at a DB-25 connector (4 AES/EBU outputs, up to 192 kHz). The digital part can be clocked internally (master) and externally via Word Clock, AES/EBU or SPDIF. RME's outstanding SteadyClock™ ensures perfect AD conversion, as jitter on the external sync sources is nearly completely removed.

All settings are done via DIP switches on the back. Analog outputs and both digital outputs operate fully simultaneously. The choice of reference level affects the analog outputs only, the signal/clip indication and the AD conversion will react only to the Gain pots.

Three in one:
High-End
microphone preamp,
High-End
line signal preamp,
8-channel AD
converter for different
analog sources.

Specifications

- 8 bal. XLR/TRS Mic/line inputs with 54 dB gain range
- Input impedance: XLR 2 kOhm, TRS 5 kOhm
- Analog input level: from -40 dBu up to +21 dBu
- Maximum output level: +21 dBu
- Output impedance: 75 Ohm
- Output level switchable Hi Gain / +4 dBu / -10 dBV
- Signal to noise ratio (SNR): 129 dB EIN @ 150 Ohm
- THD: < 0.0005 % @ 30 dB Gain
- Large frequency range (200 kHz) with special EMI input filtering
- Frequency response -0.5 dB: 5 Hz - 200 kHz
- Hi-pass filter: 80 Hz, 18 dB/oct.
- Line Out: 1/4" TRS (6.3 mm stereo jack), servo-balanced
- Phantom power: +48 Volt in every channel
- Internal wide range switching power supply 100-240 V AC
- AD conversion SNR: >110 dB(A)
- Supported sample rates: 28 kHz - 200 kHz
- THD: < 0.0003 %, < -110 dB
- Sync Sources: AES/EBU (also SPDIF coaxial), Word Clock, internal
- SteadyClock™ ensures best sound quality even with jittery external clocks

Connectivity

8 x Mic / Line Preamp Input
(XLR/TRS Combo)
8 x Line Output (TRS bal.)
8 x AD converter
(up to 192 kHz)
2 x ADAT Output
(S/MUX, up to 96 kHz)
4 x AES/EBU Output
(D-sub, up to 192 kHz)
1 x AES/SPDIF Sync Input

DMC-842

8-Channel 192 kHz AES42 Controller & Interface for Digital Microphones

Connectivity

8 x AES42, AES3 Input (XLR)

8 x Analog Output (XLR)

4 x AES/EBU Out (25-pin D-sub - 8 channels @ 192 kHz)

1 x AES/EBU In (for Synchronization, 25-pin D-sub)

2 x ADAT Out (TOSLINK) 8 ch. @ 96 kHz (S/MUX), 4 ch. @ 192 kHz (S/MUX4)

optional: 1 x MADI I/O coaxial and optical with I64 MADI Card (DMC-842 M)

MIDI I/O (2 x 5-pin DIN socket)

Word Clock I/O (BNC)

The introduction of the digital microphone technology created a demand for pro audio interfaces that can control and handle multiple digital microphones. The DMC-842 is both an 8-channel AES42 interface as well as a controller for digital microphones. When developing the DMC-842, RME worked closely with the leading microphone manufacturers to secure maximum compatibility and best functionality. As a result the DMC is the most flexible and most compatible AES42 interface available - a true milestone and basis for the acceptance of the new digital microphone technology.

Innovation . The DMC-842 makes the use of digital microphones affordable, as its price is within the same range as conventional microphone preamp/converter solutions. In addition to its role as an interface, the DMC-842 also acts as a power supply and control device for digital microphones according to the official AES42 standard. The device allows for connection and control of up to 8 digital microphones, and converting their signals to ADAT, AES/EBU, analog and (optional) MADI. Eight individually switchable hi-end sample rate converters offer a flexible clocking and further usage options, especially as the inputs are compatible to AES/EBU too.

AES42 . The operating modes defined in AES42 (Mode 1 and Mode2) are supported individually per input. Working with several Mode 1 microphones (asynchronous operation) requires the use of the DMC's sample rate converters. Mode 2 allows for a synchronized operation. In both modes control data can be sent to and status data can be received from the microphone. These can be settings for gain, polar patterns, hi-pass filter and compression. Further functions are already specified in the AES42 standard, but availability depends on the individual microphone. All microphone parameters are directly accessible from the unit's front panel.

Universal output device . In many respects, the DMC-842 is an ideal companion to RME's Micstasy. Using the same interface connections as the Micstasy (ADAT, AES/EBU, MADI) it ensures problem-free assembly of combined systems for both analog and digital microphones.

The DMC-842 even includes analog line level outputs, so there are no problems including analog devices in the signal chain, e. g. for monitoring purposes. The DMC-842 can handle standard AES/EBU signals at the same time as the Digital Phantom Power can be switched on or off for individual channels and, thanks to the built-in SRCs, can even be asynchronous. The signals passed through the DMC-842 are available at the analog outputs, making an expensive splitter box on stage obsolete.

Supports Digital Microphones from

Sennheiser
Neumann
Schoeps
and others

Technologies

AES42 Mode 1/2
AES3, AES10
MIDI Remote
Remote over MADI
MIDI over MADI
Intelligent Clock Control
ADAT S/MUX and S/MUX4
Multimode
I64 Option Slot™
SteadyClock™
SyncCheck®
SyncAlign®
TotalGain™
Cascadable

Remote Control. The DMC-842 is fully remote controllable, via MIDI, AES/EBU and MADI. The optional I64 MADI Card provides serial pass-through capability from one DMC-842 to the next device (up to 8).

To adjust the various microphone parameters, RME includes a Windows-based software application that communicates with the DMC-842 via MIDI. The DMC-842 can be fully remote controlled and configured via MIDI, and all status displays can be queried through MIDI. Each DMC-842 can be given a separate ID, allowing separate remote controllability of various devices with only one MIDI channel. All the main microphone parameters are also directly accessible on the unit itself.

MADI. The I64 MADI Card provides the DMC-842 (M) with a 64-Channel MADI input and output. Coaxial and optical output operate in parallel to the AES/EBU and ADAT output, therefore deliver the same data. Full redundancy is ensured by the automatic input switching, immediately changing to the other input in case of loss of the input signal.

The I64 MADI Card provides serial pass-through capability. Cascading is also possible between DMC-842 and other RME MADI devices, like Micstasy and ADI-8 QS.

Furthermore the I64 MADI Card provides the ability of 8 channels being used as digital return path, sending audio via MADI to the ADAT, AES and analog outputs. For example stage and studio monitors can be fed digitally from the DMC-842, making an expensive splitter box on stage obsolete. The MADI output continues to carry the analog input signals and the fed-through input data.

Features

- 8 x XLR AES42 inputs (AES3 compatible)
- 24 bit sample rate conversion switchable per input
- Digital Phantom Power switchable per input
- Fully compatible to AES42
- Supports Mode 1 and Mode 2
- AES3 compatible
- 63 dB gain range per channel, even in asynchronous Mode 1
- LED level display with 13 LEDs per channel and Peak Hold function
- M/S de-/encoding
- MADI option offers serial cascading and additional digital/analog return path
- SyncCheck tests and reports the synchronization status of the clock signals
- SyncAlign guarantees sample aligned and never swapping channels
- Fully remote controllable
- Future-proof via flash updates

Please continue on next page ...

DMC-842 continued

8 x Channel strip

Level meter with Peak Hold function, status LEDs for all channel functions (amount of amplification, Digital Phantom Power, Stereo mode, M/S Mid/Side encoding and Sample Rate Converter).

Multifunctional rotary controller

for direct access to all functions.

Analog outputs reference level and remote mode controls.

MIDI I/O

Used to remote control and transmit MIDI data via MADI.

I64 MADI Card (optional)

Coaxial and optical MADI I/O

8 x Analog line outputs

Eight balanced XLR line outputs with up to +27 dBu level. Playback of eight digital XLR Mic inputs or an eight-channel group of the MADI input signal.

Word Clock I/O

ADAT Output (TOSLINK)

Provide the same signals as the AES/EBU outputs, but in ADAT format.

AES/EBU I/O

The 25-pin D-sub connector provides four outputs and one input for clock synchronization. Wired in the widely spread Tascam standard.

8 x Input for digital microphones and AES/EBU signals

Eight balanced AES42 XLR inputs with switchable digital phantom power (DPP). Compatible to AES3 and AES/EBU.

Specifications

- Signal to Noise ratio DA (SNR): 116 dB RMS unweighted, 119 dB(A)
- THD DA: < -104 dB (< 0.00063%)
- THD+N DA: < -100 dB (< 0.001%)
- Crosstalk DA: < 110 dB
- Output level @ 0 dBFS: +24 dBu, +19 dBu, +13 dBu
- Frequency response DA, -0.5 dB: 5 Hz - 22 kHz (sf 48 kHz)
- Frequency response DA, -0.5 dB: < 5 Hz - 34 kHz (sf 96 kHz)
- Frequency response DA, -1 dB: < 5 Hz - 50 kHz (sf 192 kHz)
- Sync sources: Internal, AES, Word Clock, Option (MADI)
- Sample frequencies: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (external clocks)
- Sample rate range: MADI: 32 - 192 kHz, Word Clock: 27 - 200 kHz, AES: 28 - 200 kHz
- Jitter: Typical < 1 ns for internal, Word Clock, AES and MADI input
- Jitter suppression: > 30 dB (2.4 kHz)
- Jitter sensitivity: all PLLs operate error-free even at 100 ns
- Power supply: Internal switching mode PS, 100 V - 240 V AC, 60 Watt
- Dimensions: (WxHxD) 483 x 88 x 200 mm

PREMIUM LINE

I64 MADI Card

optional MADI I/O Slot Module

The MADI module provides total integration of Micstasy, DMC-842 and ADI-8 QS into any MADI environment. With an installed I64 MADI Card the device can also be remote controlled via MIDI over MADI.

The I64 MADI Card features an optical as well as a coaxial MADI input. Full redundancy is ensured by the automatic input switching, immediately changing to the other input in case of loss of the input signal. The MADI input will operate as an optional clock source (Clock section, OPTN) as well as a thru-input.

Since a single MADI cable can transfer up to 64 channels of audio, up to 8 RME MADI devices can be easily daisy-chained with one MADI cable per unit. They can be configured to use their individual channels within the MADI stream. The Auto Channel Assignment setup feature simplifies the channel configuration. Since each device uses only 8 channels, up to 56 channels can be passed through unchanged - only one block of eight channels is replaced. All 64 combined channels are available at the last device's MADI output.

When multiple devices are connected serially, their MADI I/O causes a delay of 3 samples. Therefore at the MADI output of the last device, the data of all former devices are delayed. A special Delay Compensation feature takes care of this offset problem.

Supported devices

Micstasy
DMC-842
ADI-8 QS

MADI Cable Drum

The ALVA MADI Cable Drum is a professional yet affordable 4-fibre SC to SC optical multicore, designed for studio, stage, broadcast and TV appplications. The used MCD cable is extremely flexible, crush and impact resistant. RME partner ALVA (www.alva-audio.com) designed a simple, but effective splash-water protection, a sturdy strain relief, and took care of easy handling. This MADI cable system suits perfectly for all mobile applications. It can be used with all RME products having optical MADI I/Os.

The MADI Cable Drum is made in Germany. Every cable comes with its own specific measuring protocol. ALVA offers support and quick service in case a replacement is necessary.

Specifications

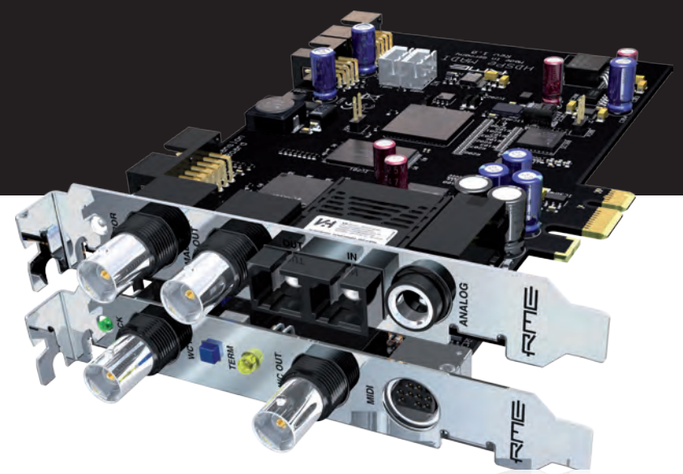
- Fibre count: 4, each with captive dust protections
- Transport and splash water protection by a handy pull-out cover
- MADI connector cover
- Secondary Coating: 900 ?m
- Diameter Cable: 5,2 mm
- Dimensions (HxWxD cm): 36 x 27 x 23 (MCD-150), 49 x 31 x 29 (MCD-300)
- Weight: 4.9 kg (MCD-150) / 10.3 kg (MCD-300)

Available lengths

100 m (MCD-100)
150 m (MCD-150)
300 m (MCD-300)
other lengths on request

HDSPe MADI

128-Channel 192 kHz MADI PCI Express Card



Connectivity

64 Input / 64 Output channels

1 x MADI I/O (optical and coaxial)

1 x Stereo Analog Out

2 x MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

optional: HDSP TCO

The HDSPe MADI is RME's innovative and outstanding PCI Express solution for MADI interfacing and turns every computer into a powerful Digital Audio Workstation. HDSPe MADI is based on the award-winning Hammerfall technology and represents the top model of this world-wide successful card line. A PCI version is available.*

HDSPe MADI is fully compatible to all devices with MADI interface, providing no less than 64 channels of 24-bit audio at a sample rate of up to 48 kHz, 32 channels at up to 96 kHz and 16 channels at up to 192 kHz. The card supports 56 and 64 channel modes, and double and single wire technology (96k frame) for 96 kHz. As usual with MADI, transmission is done via a single line, either coaxial with BNC plugs or by fiber cable. So 100 m (BNC) and 2000 m (optical) cable length can be achieved. The optional Time Code Module (TCO) for synchronization to LTC and video is also supported.

The expansion board carries Word Clock I/O (BNC) and MIDI I/O. The MIDI I/O offers two completely independent MIDI inputs and outputs via breakout cable (4 DIN sockets). A third virtual MIDI port provides a direct transmission of MIDI signals - invisibly in the MADI data stream.

Remote Control Center. The card's embedded MIDI transmission can be used to remote control RME devices without any additional cabling besides the MADI connection. RME's MIDI Remote control software for Mac and PC may use any existing MIDI port within the system to perform remote control and status requests of other RME devices.

While many MADI devices require an additional clock line, HDSPe MADI uses SteadyClock™ to extract the reference clock at lowest jitter directly from the MADI signal, making long-distance connections even more convenient. The Word Clock input automatically detects and processes Single, Double or Quad Speed signals.

A native PCI Express core and the new faster bus improve operation at lowest latencies, making it the perfect partner for live recording and live mixing applications. The integrated analog monitor output for easy control of all input and output signals is equipped with the low-latency converter technology of the ADI-8 QS, guaranteeing stunning SNR and THD values.

Integrated DSP mixer. The card's hardware-based TotalMix routes and mixes 64 inputs and 64 playback channels completely independent to 64 physical outputs, turning the card into a powerful router/mixer that can be used in many different ways, like:

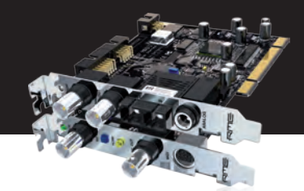
- MADI optical patchbay and router
- MADI coaxial/optical or vice versa converter and splitter
- MADI redistributor, patchbay and router

For Windows and Mac OS.

Technologies

MADI Multinorm
MADI Quad Wire
MADI Redundancy
MIDI over MADI
Quick Boot
Intelligent Clock Control
SteadyClock™
SyncCheck™
SyncAlign®
Cascadable

The HDSPe MADI combines ultimate driver technology with the highest number of audio I/O channels ever implemented in a PCIe-card solution – ready to fit into the DAW application of your choice.



Furthermore, the DSP hardware calculates RMS and peak level meters for all audio channels, without any measurable CPU load.

Up to three HDSPe MADI cards can be used simultaneously, providing up to 192 inputs and 192 outputs on a single workstation. The card uses the same driver as other HDSP(e) series cards. These cards can be used simultaneously for ADAT, AES/EBU and analog I/Os all in one single machine.

* HDSP MADI . the PCI version

Compared with the HDSP MADI (PCI version), the PCI Express card offers new features: Support of sample rates up to 192 kHz (HDSP MADI: 96 kHz), more functions in TotalMix (phase and internal loopback per channel, +6 dB gain for the hardware outputs), and a direct support of the Time Code Option.

Features

- Any settings changeable in realtime
- Automatic intelligent master/slave clock control
- Extremely low latency (8 buffer sizes) down to 1.5 ms
- Transfer of MIDI data alongside MADI
- 2 independent MIDI I/Os (breakout cable incl.)
- SteadyClock™: for highest jitter suppression and clock regeneration, super-stable digital clock
- Available drivers: Windows 2000/XP, Vista 32/64 (multi-client operation of ASIO 2.0, WDM, GSIF); MAC OS X Intel from 10.4 (Core Audio / Core MIDI)
- Quick Boot: Onboard memory for the last setting
- Comes with DIGICheck: the ultimate measurement, analysis and test tool
- direct support of HDSP TCO (Time Code Option)

Specifications

- 1 Lane PCI Express endpoint device (no PCI Express to PCI bridge), revision 1.1., 2.5 Gbps line speed
- Packet-based full-duplex communication (up to 500 MB/s)
- Input Word Clock: BNC, Signal Adaptation Circuit (functional from 1.2 Vpp input signal), switchable termination
- Output Word Clock: BNC, low-impedance driver stage, 4 Vpp into 75 Ohms, short-circuit-proof
- Sample rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (Sync/Word Clock)
- Sync sources: MADI coaxial, MADI optical, Word Clock, internal
- Sample rate range: MADI: 32 - 96 kHz, Word Clock: 27 - 200 kHz
- Varipitch: by input signal or Word Clock
- Jitter: < 1 ns, internal and all inputs
- Jitter sensitivity: PLL operates even at 100 ns Jitter without problems

HDSPe MADIface

128-Channel 192 kHz MADI ExpressCard for mobile computers

The HDSPe MADIface combines ultimate driver technology with the highest number of audio I/O channels ever implemented in a mobile ExpressCard solution – ready to fit into the DAW application of your choice.

Connectivity

64 Input / 64 Output channels

1 x MADI I/O (optical and coaxial)

No external power supply required

Consisting of the HDSPe ExpressCard MADI and a small breakout box, the MADIface offers full MADI power: 64 channels input and 64 channels output, up to 192 kHz sample rate, in MADI embedded MIDI transmission, complete TotalMix that is even remote controllable and has all features of the 'bigger' HDSPe MADI, as well as lowest latency and CPU load. To make the usage as comfortable as possible, the power for the breakout box is provided directly by the ExpressCard, so no external power supply is required.

The MADIface is fully compatible to all devices with MADI interface. Of course it can be used perfectly in combination with RME's own MADI series products. For example with the ADI-648 an 8 x ADAT optical interface is realized, unbeatable in price and performance. And with the ADI-6432 a bidirectional AES/EBU frontend with 64 channels is set up hassle-free.

The MADIface offers full support for 56 and 64 channel modes and double and single wire technology (96k frame) for 96 kHz. Full 64 channel support can also be found in the hardware mixer TotalMix. All 64 inputs and 64 playback channels can be routed and mixed to 64 physical outputs completely freely, which translates to an 8192 channel mixer. With that, RME's MADI interfaces offer the most powerful router/mixer ever implemented on an ExpressCard, and can do much more than just providing ins and outs:

- MADI optical patchbay and router

- MADI coaxial/optical or vice versa converter and splitter

- MADI redistributor, patchbay and router

TotalMix can be completely remote controlled via MIDI. Furthermore, the hardware delivers RMS and peak level meters for full control over 192 audio channels at minimal CPU load.

Up to 3 MADIfaces and HDSPe Multiface/Digiface can be used simultaneously, in every possible combination. With this up to 192 inputs and 192 outputs are available at 48 kHz, 96 inputs and 96 outputs at 96 kHz. Please note that most laptops have only one PCI Express slot.

RME's HDSPe ExpressCard MADI is a true PCI Express solution, achieving significant performance gains in multi-track audio and lowest latency. The ExpressCard MADI serves as power supply for the breakout box, freeing you from the hassle of additional wall warts. Thanks to RME's flash update technology, future firmware improvements, adjustments, and bugfixes can be installed easily at any time.

For Windows and Mac OS.

Technologies

MADI Multinorm
MADI Quad Wire
MADI Redundancy
MIDI over MADI
Quick Boot
Intelligent Clock Control
SteadyClock™
SyncCheck™
SyncAlign®

Differences to HDSPe MADI

- No direct Word Clock I/O *
- No direct MIDI I/O **
- No analog monitor output
- TCO cannot be used

* The MADIface (like all RME devices) uses SteadyClock™ to extract the reference clock at lowest jitter directly from the MADI signal, making long-distance connections even more convenient. Although not available at the MADIface itself, Word Clock input and output are available when using another RME MADI device.

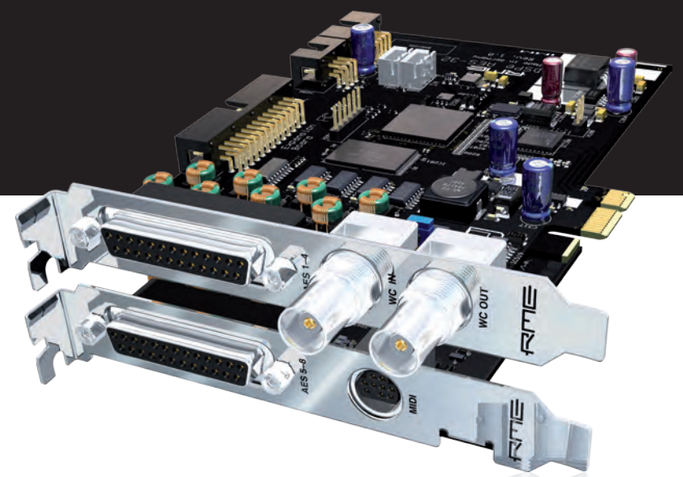
** The MADIface offers a virtual MIDI port within the driver. Mainly intended for remote controlling further RME devices, it can also be used to send and receive usual MIDI data. The MIDI data are invisibly inserted into and transmitted by the MADI signal. Therefore a physical access is given at the RME interface connected to the MADIface.

Specifications

- ExpressCard/34 format (standard 34 mm size)
- 1 Lane PCI Express endpoint device (no PCI Express to PCI bridge), revision 1.1, 250 MB/s transfer rate per direction
- Secure BIOS Technology: card stays fully functional even when the flash process fails
- Output: IEEE 1394 connector, not compatible to FireWire
- MIDI input and output: via virtual MIDI port and MADI transmission
- Sync sources: MADI coaxial, MADI optical, internal
- Varipitch: by input signal
- Sample rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz, variable (Sync/DDS)
- Jitter: < 1 ns, internal and all inputs
- Jitter sensitivity: PLL operates even at 100 ns Jitter without problems
- Available drivers: Windows 2000/XP, Vista 32/64 (multi-client operation of ASIO 2.0, WDM, GSIF);
  MAC OS X Intel from 10.4 (Core Audio / Core MIDI)
- Comes with DIGICheck: the ultimate measurement, analysis and test tool

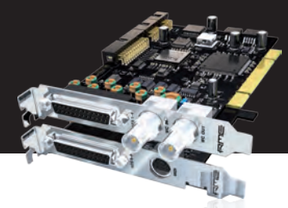
HDSPe AES

32-Channel 192 kHz AES/EBU PCI Express Card



The perfect solution for professional users in the fields of broadcast, TV, theater, stage/PA - and in any pro-audio studio with the typical RME features and quality.

* HDSP AES-32 , the PCI version



Connectivity

16 Input / 16 Output channels

8 x AES/EBU I/O (2 x D-sub25)

2 x MIDI I/O (5-pin DIN)

Word Clock I/O (BNC)

optional:

HDSP TCO

BOB-32 Breakout Box

For Windows and Mac OS.

The HDSPe AES provides eight AES inputs and eight AES outputs (16 channels each) even at the highest sample rate of 192 kHz. It supports Single, Double and Quad Wire transfer and the conversion between these formats. The two slot PCI Express card is also equipped with two MIDI I/O ports and Word Clock I/O. The Word Clock input adapts to to Single, Double and Quad Speed signals automatically. A PCI version (HDSP AES-32) with identical features is also available.*

The card's main board carries Word Clock I/O and a 25-pin D-sub connector, providing audio channels 1 to 8 with four AES inputs and four AES outputs in the standard TASCAM pinout format. Its Word Clock input operates with Single, Double and Quad Speed signals automatically. The expansion board adds audio channels 9 to 16 and a connector for the MIDI breakout cable with two MIDI I/Os.

The card uses a newly developed genuine PCI Express core, which consequently takes full advantage of the new format, achieving significant performance gains in multi-track audio and lowest latency.

Integrated DSP mixer. The hardware-based TotalMix with 42 bit internal resolution is used to route or mix all 16 inputs and 16 playback channels freely to 16 physical outputs, offering extraordinary monitoring capabilities. Up to 8 fully independent stereo submixes can be created. Routings can be copied and pasted, faders ganged and grouped, which, along with the amazing matrix window, turns the HDSPe AES into a powerful and easy-to-use redistributor, patchbay, router, converter, and splitter. TotalMix is fully MIDI-controllable and calculates RMS and peak level meters for all audio channels in hardware, with no measurable CPU load.

The Time Code Option (TCO) can be used with the HDSPe AES to sync to LTC and video. Thanks to SteadyClock™, the TCO not only extracts absolute positions from LTC, but also a very clean low-jitter Word Clock from LTC and video.

BOB-32. An optional 19" breakout box is also available. Its innovative design features XLR I/Os that can be accessed from the front or rear in a rack, according to the user's choice. BOB-32 provides D-sub connectors with Tascam and Yamaha pinout, therefore can be used with other devices as digital rack breakout box as well.

Up to three HDSPe AES cards can be used simultaneously on a single workstation. The card is based on the same driver architecture as the HDSP(e) MADI and the HDSP AIO mastering card. Thanks to RME's flash update technology, future firmware improvements, adjustments, and bugfixes can be installed easily at any time.

Technologies

Quick Boot
Intelligent Clock Control
SteadyClock™
SyncCheck™
SyncAlign®
Cascadable

The HDSPe AES in- and outputs can be easily equipped with standard XLR-breakout cables via standard 25-pin D-sub AES/EBU connectors in TASCAM pinout format. TASCAM to Yamaha pinout cables and format converters are also available. Your Premium Line dealer offer various cables - 192 kHz ready - in different lengths (ALVA cableware).

ALVA breakout cable D-sub25 to 4 x XLR-3 female + 4 x XLR-3 male

Available with 1m, 3m and 6 m length.

ALVA breakout cable D-sub25 male to D-sub25 male

Available with 1m, 3m and 6 m length.

Features

- Support for 192 kHz at full channel count
- Extremely low latency (8 buffer sizes) down to 1.5 ms
- Quick Boot: Onboard memory for the last setting
- 2 independent MIDI I/Os (breakout cable incl.)
- Zero Latency Monitoring (ZLM) for latency-free submixes and perfect ASIO Direct Monitoring
- SteadyClock™: for highest jitter suppression and clock regeneration, super-stable digital clock
- Available drivers: Windows 2000/XP, Vista 32/64 (multi-client operation of ASIO 2.0, WDM, GSIF); MAC OS X Intel from 10.4 (Core Audio / Core MIDI)
- Comes with DIGICheck: the ultimate measurement, analysis and test tool

Specifications

- 1 Lane PCI Express endpoint device (no PCI Express to PCI bridge), revision 1.1., 2.5 Gbps line speed
- Packet-based full-duplex communication (up to 500 MB/s)
- Input Word Clock: BNC, Signal Adaptation Circuit (functional from 1.2 Vpp input signal), termination via jumper
- Output Word Clock: BNC, low-impedance driver stage, 4 Vpp into 75 Ohms, short-circuit-proof
- Sync sources: 8 x AES, Word Clock, internal
- Varipitch: by input signal or Word Clock
- Sample rates: 32 kHz up to 192 kHz, variable (Sync/Word Clock)
- Sample rate range: AES: 28 - 204 kHz, Word Clock: 28 - 204 kHz
- Jitter: < 1 ns, internal and all inputs
- Jitter sensitivity: PLL operates even at 100 ns Jitter without problems

BOB-32

Universal XLR/SUB-D Breakout Box

Connectivity

8 x XLR Output

8 x XLR Input

2 x D-sub 25-pin connectors

Perfect match: The BOB-32 Breakout Box is an advanced solution for interconnecting multichannel XLRs and D-subs. The box connects 2 x 8 XLR connectors with two 25-pin D-sub connectors, working basically like two breakout cables. All 16 XLR connectors can be connected to the 19″ rack mount unit instead of a usual multicore breakout cable, preventing cable chaos, errors and connection problems. BOB-32 is pin compatible to the digital TASCAM (=RME) and Yamaha formats. The pinout format can easily be changed with internal jumpers. Therefore BOB-32 is the perfect partner for the HDSP(e) AES-32 and many other units having digital audio D-sub I/Os.

Flip-Frame. The BOB-32 allows to change rack brackets and handles from front to rear and thus to change XLR or D-sub from front to rear as well. This way a BOB will perfectly fit in every rack and working situation.

Revolutionary new option: Simply fold the case in the middle to arrange both sides to one side.

All connectors appear on front or rear only, as a two height unit within the rack.

Supported Devices

HDSPe AES
HDSP AES-32
Micstasy
DMC-842
ADI-6432
ADI-8 QS
any device with D-sub connectors in YAMAHA or TASCAM pinout format

RME partner ALVA (www.alva-audio.com) offers several professional cables and useful format converters (TASCAM <> Yamaha pinout). Please ask your local RME dealer for specific cables.

D-sub to D-sub cables:

ALVA Part no.: BO25M25M1PRO (1 m)

ALVA Part no.: BO25M25M3PRO (3 m)

ALVA Part no.: BO25M25M6PRO (6 m)

D-sub to 4+4-XLR cables:

ALVA Part no.: BO25MXLR4M4F1PRO (1 m)

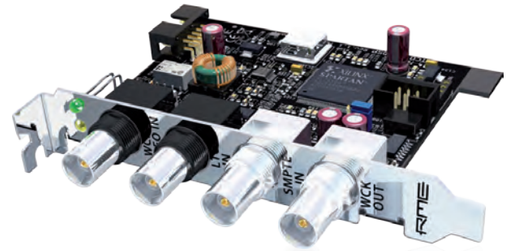
ALVA Part no.: BO25MXLR4M4F3PRO (3 m)

ALVA Part no.: BO25MXLR4M4F6PRO (6 m)

PREMIUM LINE

HDSP TCO

Optional HDSPe synchronization module



Time Code Option: The TCO module is an optional extension for selected RME cards. Placed in a free slot of the computer chassis the TCO will be connected with the HDSPe card via a flat ribbon cable. The small module adds a Word Clock input to the HDSPe card, and offers a synchronization to LTC and video.

The TCO has a combined switchable Word Clock/Video input (BNC) as well as an LTC input (BNC). The Word Clock / Video input can comfortably be terminated (relay-controlled) with a 75 Ohm terminator from the card's Settings dialog. The TCO also features an additional LTC output (BNC) with two level settings (configurable via jumper).

Thanks to SteadyClock, the TCO not only extracts absolute positions from LTC, but also a very clean low-jitter Word Clock from LTC and video. Thus a sample accurate timecode synchronization to audio or video sources is assured.

LTC can be derived and generated in all common formats, i.e. 24, 25, 30, and 29.97 frames; drop-frame or non-drop-frame. Commonly used Pull-Up and Pull-Down Formats (+/- 0.1% and +/- 4%) can be utilized, and PAL and NTSC video formats will be automatically detected and processed.

The received Time Code can be sent to the audio or video application as ASIO Positioning Protocol (APP) or MTC. An application can send APP or MTC to the TCO, which will generate LTC on hardware level with lowest jitter (no software/driver routine). Several fly-wheel functions facilitate chase operation (adjustable drop-out length, Continuous- or Jam-Sync).

Specifications

LTC In

- Level range: -25 dBu up to +12 dBu

LTC Out

- Output level: +4 dBu, via Jumper -7 dBu
- Outputs impedance: 220 Ohm

Word Clock In (Video In)

- Not affected by DC-offsets within the network
- Signal Adaptation Circuit: signal refresh through auto-center and hysteresis, Overvoltage protection
- Level range: 1.0 Vpp - 5.6 Vpp
- Lock Range: 28 kHz - 200 kHz
- Jitter when synced to input signal: < 1 ns
- Jitter suppression: > 30 dB (2,4 kHz)

Word Clock Out

- Max output voltage: 5 Vpp
- Output voltage @ 75 Ohm: 4,0 Vpp
- Outputs impedance: 10 Ohm
- Frequency range: 28 kHz - 52 kHz

Video In (Word Clock In)

- Format: PAL and NTSC

Connectivity

1 x Word Clock I/O

1 x Video Sync Input (alternative to WC In)

1 x LTC I/O

Supported Cards

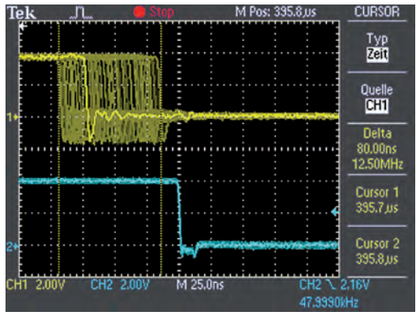
all RME HDSPe PCI Express Cards and HDSP AES-32

SteadyClock ™

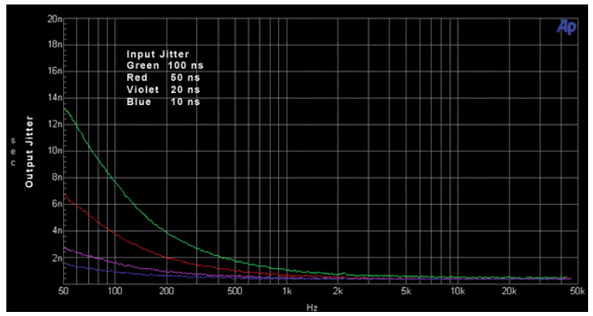
In digital audio, the clock frequency is an essential factor, as it creates the correlation between the audio bits and the time reference. Unfortunately, the clock frequency is not always as stable as desired. Small fluctuations of the clock frequency are referred to as „Jitter", measured in nanoseconds (ns). The effects of jitter on the audio conversion are manifold – from a somewhat rough sound quality, to clicks and dropouts in extreme cases. To solve these issues, RME have developed a completely new technology for synchronization and jitter suppression in digital audio signals - SteadyClock.

Normally, the circuitry for clock synchronization consist of an analog PLL (Phase Locked Loop) and several quartzes for the various frequencies. Such PLL systems sync very fast, but consequently have no jitter suppression. Ceramics filters or special DDS-Chips (Direct Digital Synthesis) define systems with active jitter suppression, but with slower sync speed, and tend to be very costly.

SteadyClock works with only one crystal, an internal clock reference of 200 MHz, and an internal DDS clock generator which resides within the FPGA (Field Programmable Gate Array). SteadyClock locks in fractions of a second to the input signal, yet provides a remarkable jitter suppression in the audio band.



Picture 1 shows the MADI input signal with 80 ns of jitter (top graph, yellow). Thanks to SteadyClock this signal turns into a clock with less than 2 ns jitter (lower graph, blue).



Picture 2 This diagram shows SteadyClock's jitter reduction for various jittery input signals over the audio band, from 50 Hz to 50 kHz.

Conclusion. The SteadyClock technology guarantees an excellent performance in all clock modes. Its highly efficient jitter suppression enables RME devices to refresh and clean up any clock signal, and to provide the clock signal as reference clock at the Word Clock output. At the same time, analog conversion is performed on a guaranteed level of highest quality, completely independent from the kind and quality of the used reference clock. The cleaned and jitter-freed clock signal can be used as reference clock in any application, so the quality of the external (input) clock doesn't matter anymore.

Quick Boot

RME PCI Express and PCI cards, like the HDSPe MADI and HDSPe AES, have implemented a boot memory option that activates the card's key settings immediately on power on. Rather than operating in a default mode from the moment the PC is switched on until the driver is loaded, the card will immediately activate the last used sampling rate, master/slave configuration, thus eliminating any start-up noise or problems in the clock network at system start or reboot.

InstantMemory ™

All RME Premium Line units support InstantMemory, a feature that stores your setup automatically during instances of power blackout, or during shutdown for "next day" use. All the device's settings are stored and recalled automatically during power down/up.

SyncCheck® and ICC ™

SyncCheck. When working with several digital sources it is not only necessary that these are all properly locked, they also have to be totally synchronized. Else drop outs and crackling occurs. RME's exclusive SyncCheck checks all input signals. In clock mode Master the synchronous operation to the internal clock is checked. This outstanding and unique technology helps to find errors immediately. The actual state of each input is displayed in the Settings dialog.

Intelligent Clock Control (ICC). The unique SyncCheck and AutoSync technology has evolved into the new Intelligent Clock Control, the only digital I/O-system capable of measuring and displaying the frequency of all clock sources. Even Word Clock! Based on validity and current sample rate the system decides which clock source should be used - fully automated and performed in hardware. These technologies offer the most easiest clock handling, plus the most advanced support when configuring the clock setup.

No Noise Pollution

RME units do not contain any kind of mechanical noise elements or audible frequency emitting components (exception: M-32 converter fans). So feel free to put any of our units anywhere - even in very quiet surroundings like control or recording areas. Because we design our units with the lowest power consumption and as little heating as possible, they don't overheat easily.

In high density 19 inch mounting areas, please ensure that there's ongoing natural ventilation and a decent outside temperature. The manuals include further information about the specified operation temperatures.

RME's MADI Multinorm - supported MADI formats/modes

Type	Channels	Resolution (bit)	Sample Freq. (kHz)	Frame Rate Word Clock	Hints
Standard 1	56	24	48	48	with ±12.5% Varispeed
Standard 2	64	24	48	48	without Varispeed
Double Wire 96/48k Mode	32	24	96	48	with sample freq. doubled the ch. data will be split on two ch. (ADAT > S/MUX, Tascam > Dual Line)
Quad Wire 192/48k Mode	16	24	192	48	with sample frequency quadrupled the ch. data will be split on four ch. (ADAT > S/MUX4)
Frame Rate 96	32	24	96	96	96k Frame

MADI . Optical Fibres Requirements

Optical fibres have become a new standard.

Why glass fibre optics?

The need for huge data transmissions is constantly growing. In the near future traditional twisted-pair copper cables will not meet the requirements of ethernet networks. With Gigabit or 10 Gigabit, traditional cables reach the physical limits. Only optical glass fibres will meet future transmission demands.

Advantages of Optical Fibre compared to Copper Cable:

- Insensitive to electromagnetic disturbance
- Optical cables can be run in parallel to power cables etc.
- No crosstalk, hum or potential differences
- No influence on audio quality also in long distance applications
- Significantly less weight

Many manufacturers offer optical cables and connectors, and even complete road-ready systems with cable drums, with up to 2000 m in total length. Please ask your Premium Line dealer for the supporting product line of RME-approved digital audio cables from ALVA Cableware (www.alva-audio.com).

Multimode and Singlemode fibres

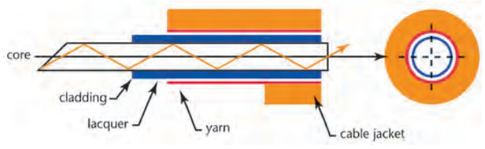
All RME MADI products provide optical I/Os for the use with multimode fibres. They consist of a core, a cladding and a primary coating. The light-transmitting cable core is made of fibres of glass, and carries the actual signal. The coating totally reflects the light and thus conducts it within the core.

The coating is a protective layer against mechanical damage and is usually between 150 and 500 µm in thickness. Between the cladding and the coating, there is a fine layer of lacquer (2 to 5 µm) to keep out moisture. The coating is usually made of soft plastic, but special versions with extremely stable coatings are also available. By now, optical cables can be manufactured cheaper than copper based cables.

Singlemode transceivers are available on request for all units and allow for an operation within existing singlemode networks, without additional expensive converters.

Multimode fibre example

- Diameter core: 50 µm or 62.5 µm

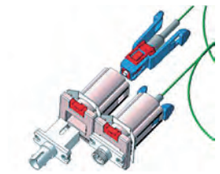


- Diameter wrap glass: 125 µm
- Max. transmission width: 2000 m
- Outside diameter: 4 - 9 mm
- Label: 50/125 (orange) or 62.5/125 (blue)

Connectors

Like most other MADI devices, the RME MADI products use the common SC-Plug (IEC 874-19) for optical connection. The SC connector is compact and ensures a reproducible and constant connection quality.

The SC duplex version combines two fibres. An automatic interlock



prevents accidental interruption of the connection.

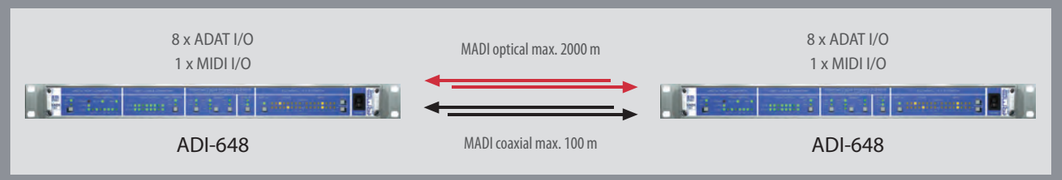
The fibre type, explicitly required for optical MADI connections, must be a 50/125 µm or 62.5/125 µm multi-mode fibre (MM fibre).

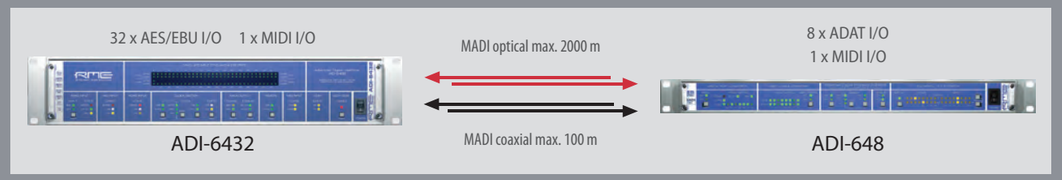
PREMIUM LINE

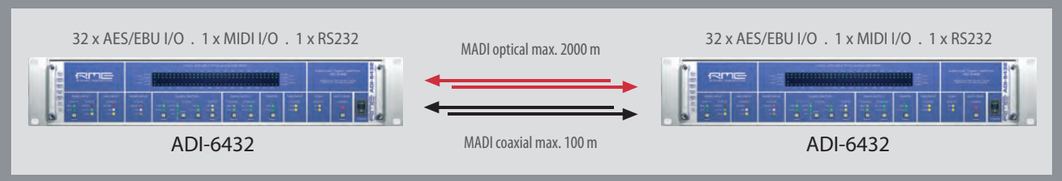
Terminology

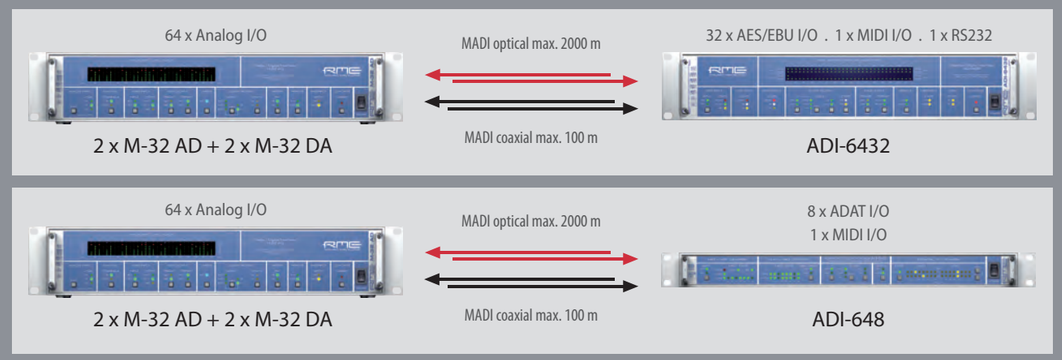
Single Speed	Sample rate range originally used in Digital Audio. Typical applications are 32 kHz (digital radio broadcast), 44.1 kHz (CD), and 48 kHz (DAT).
Double Speed	Doubles the original sample rate range, in order to achieve higher audio quality and improved audio processing. 64 kHz is practically never used, 88.2 kHz is quite rare in spite of certain advantages. 96 kHz is a common format. Sometimes called Double Fast.
Quad Speed	Controversially discussed way of ensuring hi-end audio quality and processing by quadrupling the sample frequency. 128 kHz is non-existent, 176.4 kHz is rare, if at all then 192 kHz is used, e.g. for DVD Audio.
Single Wire	Standard audio data transfer, where the audio signal's sample rate is equal to the rate of the digital signal. Used from 32 to 192 kHz. Sometimes called Single Wide.
Double Wire	Before 1998 there were no receiver/transmitter circuits available that could receive or transmit more than 48 kHz. Higher sample rates were transferred by splitting odd and even bits across the L/R channels of a single AES connection. This provides for twice the data rate, and hence twice the sample rate. A stereo signal subsequently requires two AES/EBU ports. The Double Wire method is an industry standard today, however it has a number of different names, like Dual AES, Double Wide, Dual Line and Wide Wire. The AES3 specification uses the uncommon term Single channel double sampling frequency mode. When used with the ADAT format, the term S/MUX is commonly used. Double Wire not only works with Single Speed signals, but also with Double Speed. As an example, Pro Tools HD, whose AES receiver/transmitter only work up to 96 kHz, uses Double Wire to transmit 192 kHz. Four channels of 96 kHz turn into two channels of 192 kHz.
Quad Wire	Similar to Double Wire, with samples of one channel spread across four channels. This way single speed devices can transmit up to 192 kHz, but need two AES/EBU ports to transmit one channel. Also called Quad AES.
S/MUX	Since the ADAT hardware interface is limited to Single Speed, the Double Wire method is used for sample rates up to 96 kHz, but usually referred to as S/MUX (Sample Multiplexing). An ADAT port supports four channels this way.
S/MUX4	The Quad Wire method allows to transmit two channels at up to 192 kHz via ADAT. The method is referred to as S/MUX4. Note: All conversions of the described methods are lossless. The existing samples are just spread or re-united between the channels.
48K Frame	Most often used MADI format. Supports up to 64 channels at up to 48 kHz.
96K Frame	Frame format for up to 32 channels at up to 96 kHz. The advantage of this format against 48K Frame using S/MUX: the receiver can detect the real (double) sample rate on its own and immediately. With 48K Frame and S/MUX, the user has to set up the correct sample rate in all involved devices manually.
MADI 56/64-Channel Mode	MADI, the serial Multichannel Audio Digital Interface, has been defined already in 1989 as an extension of the existing AES3 standard. MADI contains 28 AES/EBU signals (56 audio channels) in serial, and the sample rate can vary by +/-12.5%. A data rate of 100Mbit/s cannot be exceeded. Because an exact sampling frequency is used in most cases, the 64 channel mode was introduced officially in 2001. It allows for a maximum sample rate of 48 kHz + ca. 1%, corresponding to 32 channels at 96 kHz, without exceeding the maximum data rate of 100 Mbit/s. Older devices understand and generate only the 56 channel format. Newer devices often work in the 64 channel format, but offer still no more than 56 audio channels.

Digital Multicore . 64 Audio Channels bidirectional with embedded MIDI / Serial (RS232)

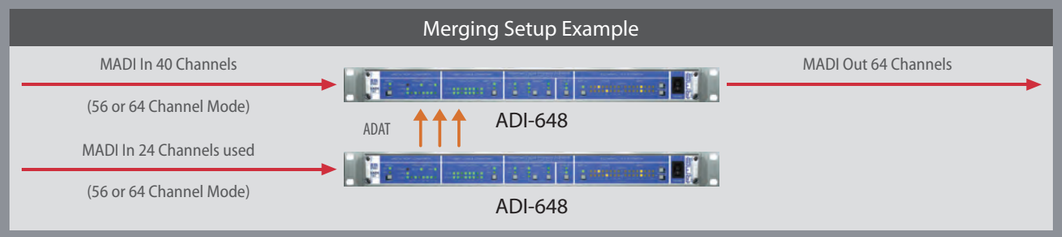


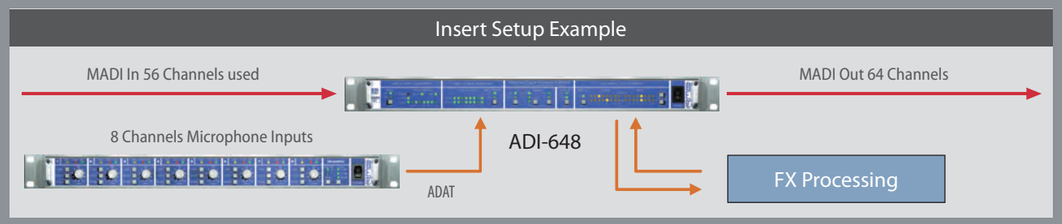



32 x AES/EBU I/O . 1 x MIDI I/O . 1 x RS232
ADI-6432
MADI optical max. 2000 m
MADI coaxial max. 100 m
32 x AES/EBU I/O . 1 x MIDI I/O . 1 x RS232
ADI-6432

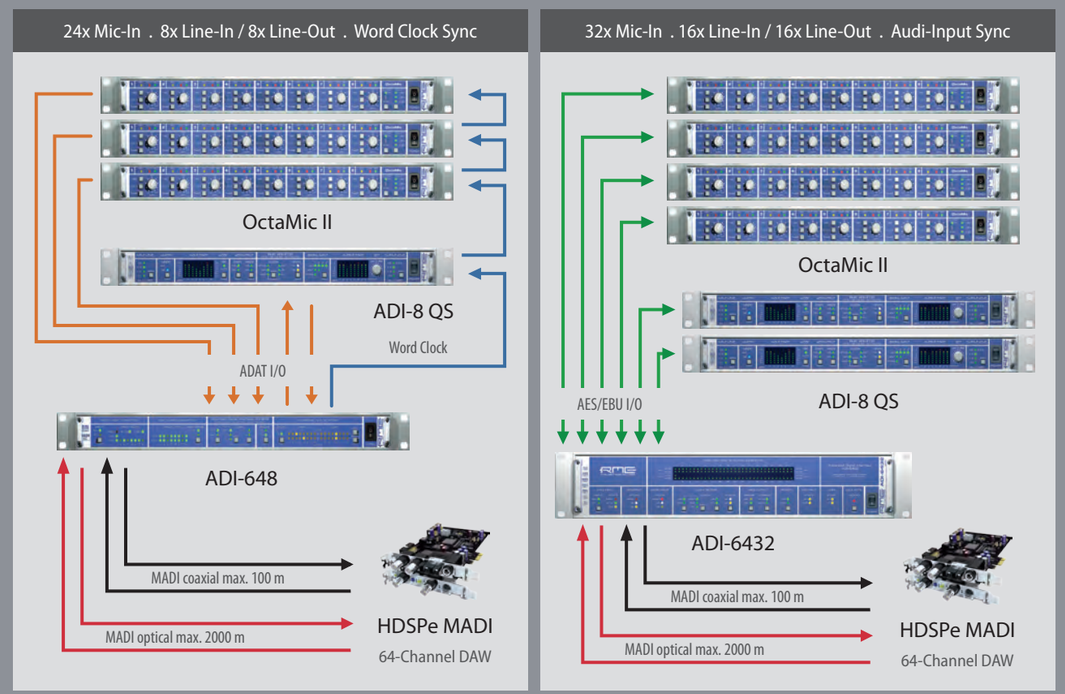

64 x Analog I/O
2 x M-32 AD + 2 x M-32 DA
MADI optical max. 2000 m
MADI coaxial max. 100 m
32 x AES/EBU I/O . 1 x MIDI I/O . 1 x RS232
ADI-6432
64 x Analog I/O
2 x M-32 AD + 2 x M-32 DA
MADI optical max. 2000 m
MADI coaxial max. 100 m
8 x ADAT I/O
1 x MIDI I/O
ADI-648

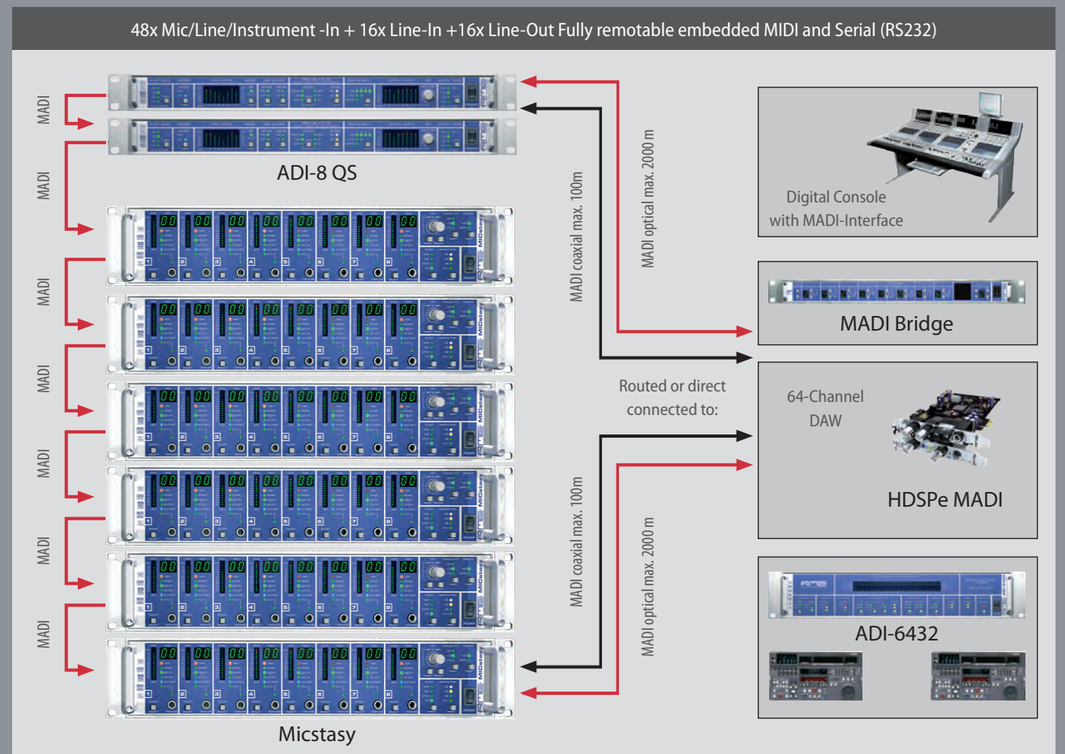
Merge and Insert



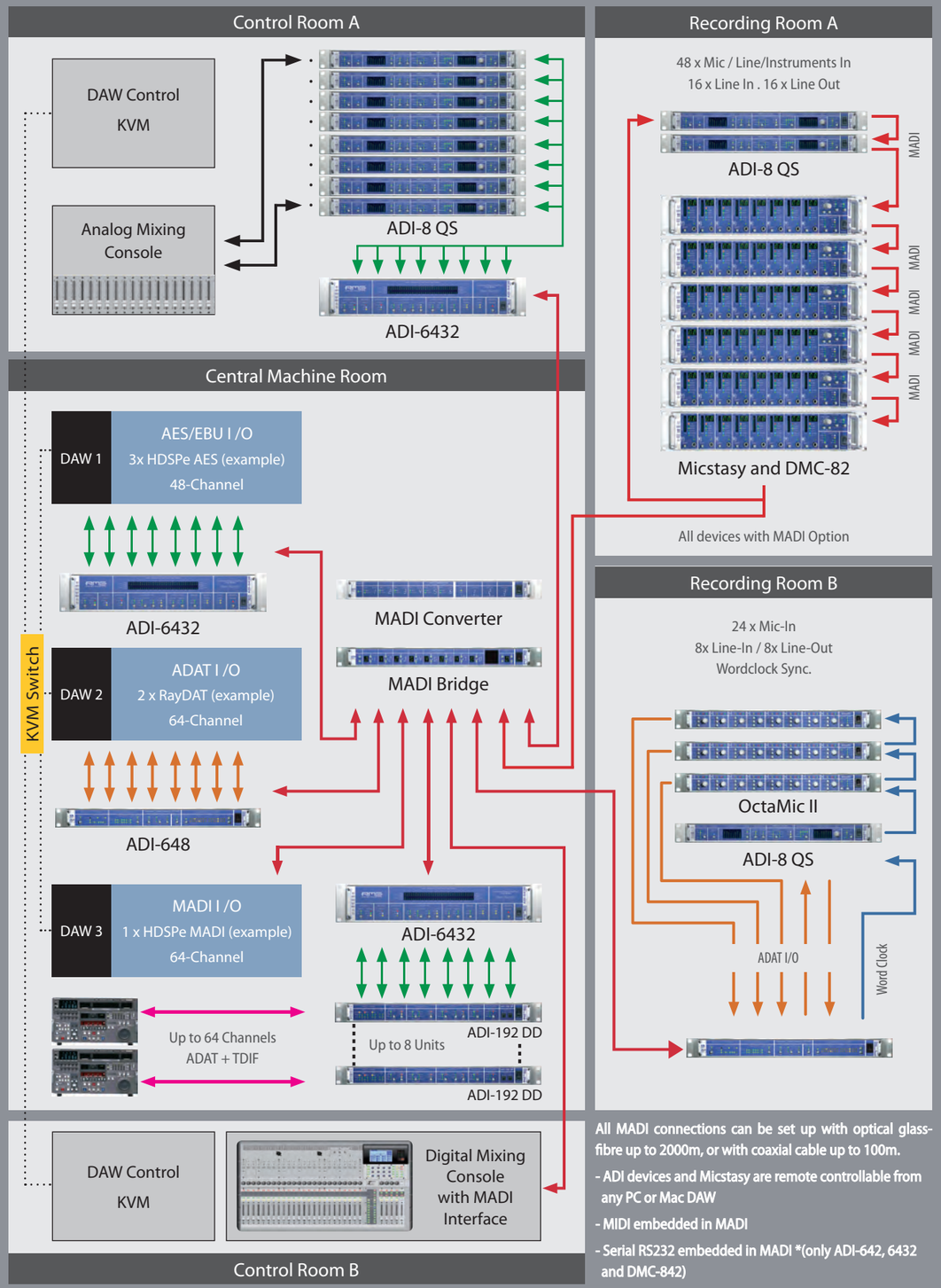


MADI Front-End





Studio Network



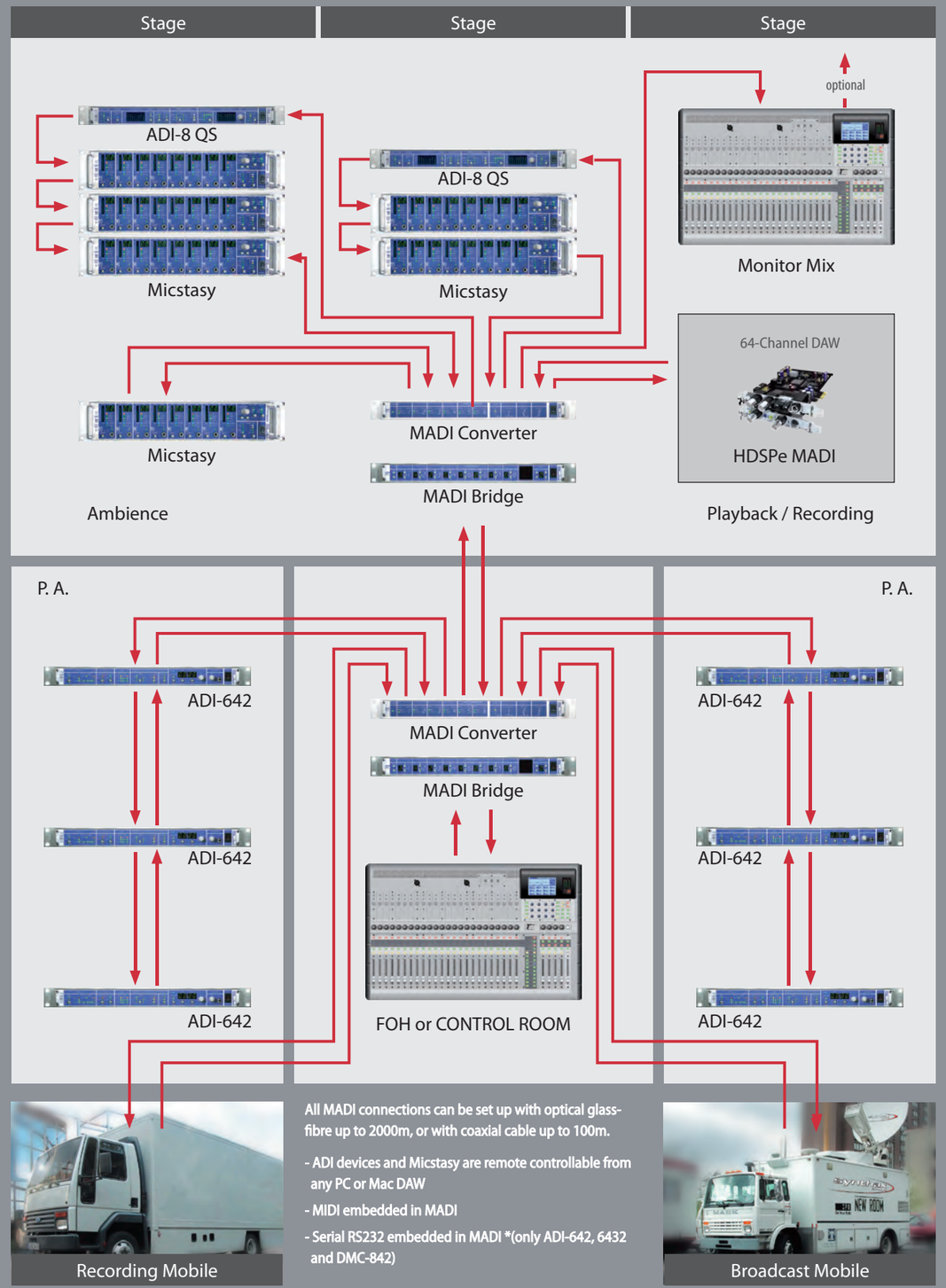
All MADI connections can be set up with optical glass-fibre up to 2000m, or with coaxial cable up to 100m.

- ADI devices and Micstasy are remote controllable from any PC or Mac DAW
- MIDI embedded in MADI
- Serial RS232 embedded in MADI *(only ADI-642, 6432 and DMC-842)

PREMIUM LINE

MADI Setup example

Stage . Live Applications . Recording . Theater



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10	ADI-8 QS	
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